



TATA CO.

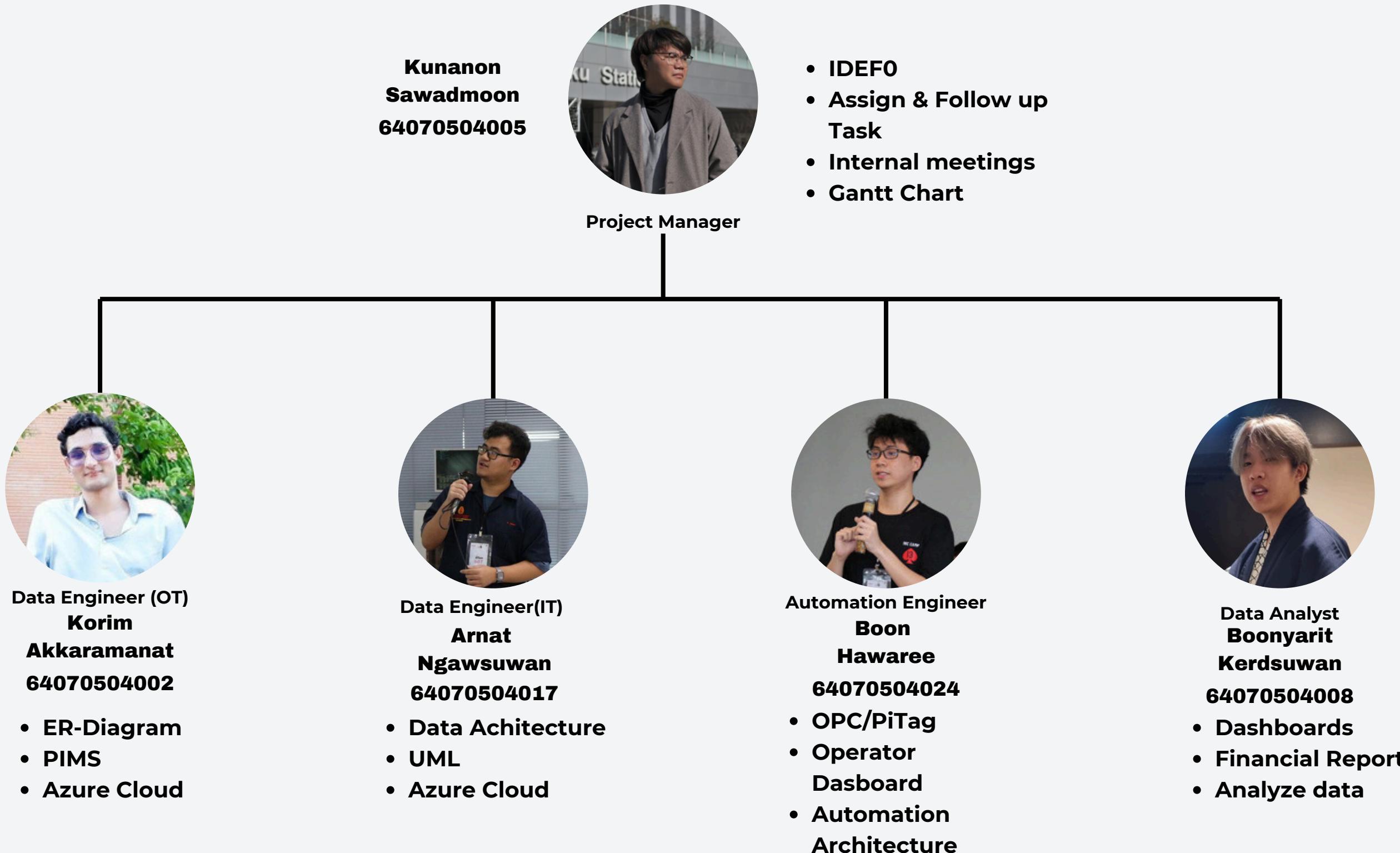
# OIL DISTRIBUTION PROJECT



# ABOUT US



TATA Co.



# AGENDA



## System Overview

Go over the team operation and system function



## Data analyst & IT

Go over a comprehensive overview of the dashboard and report output of the system



## Operate Technology

Go over the system providing the data collection



## Automation Archirechture

Go over the system architechture and each devices used in the operation

# CDIO INITIATIVE



## 1st Phase Conceive Phase

Defining customer needs; considering technology, enterprise strategy, and regulations; developing concepts, techniques and business plans.



## 2nd Phase Design Phase

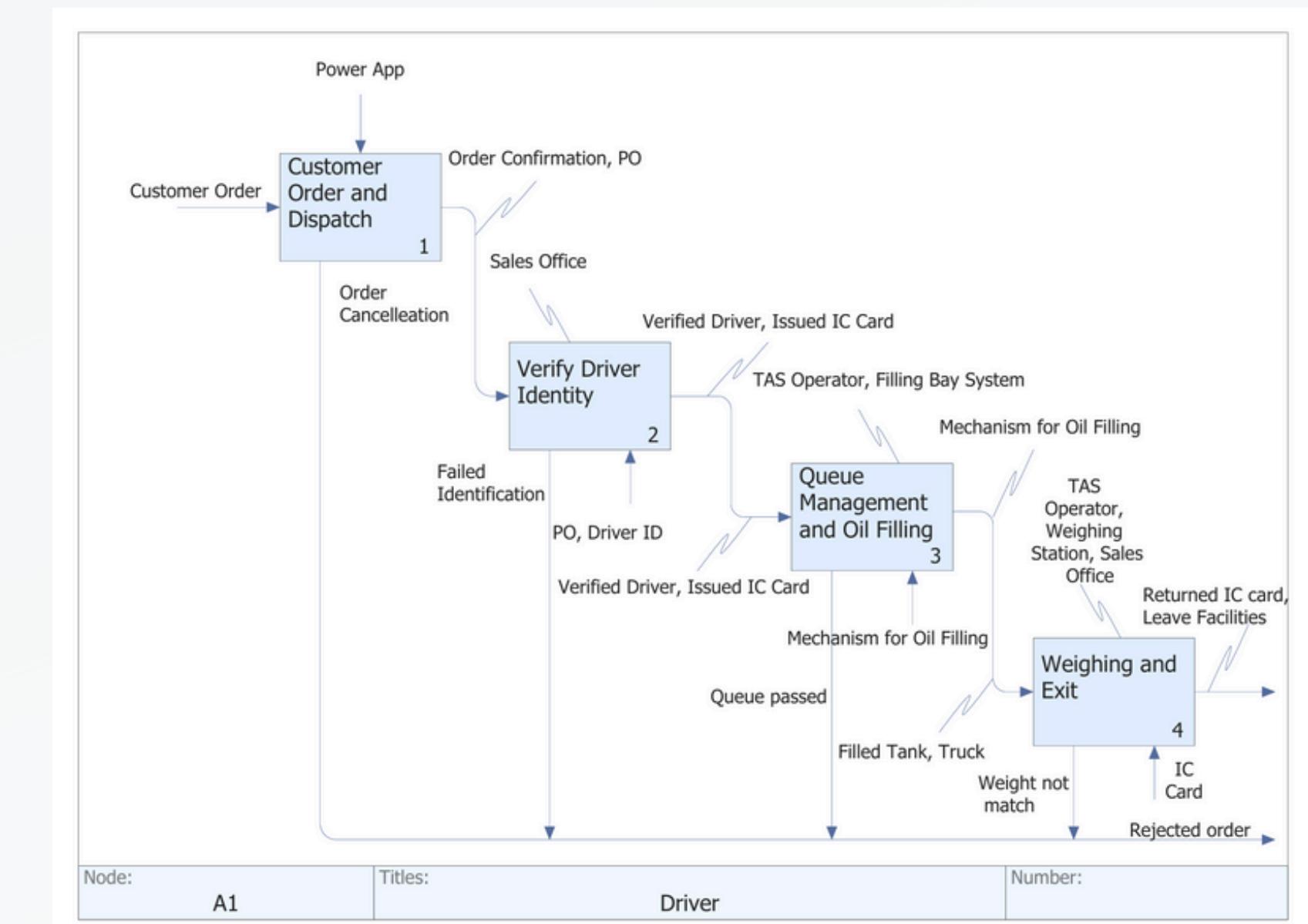
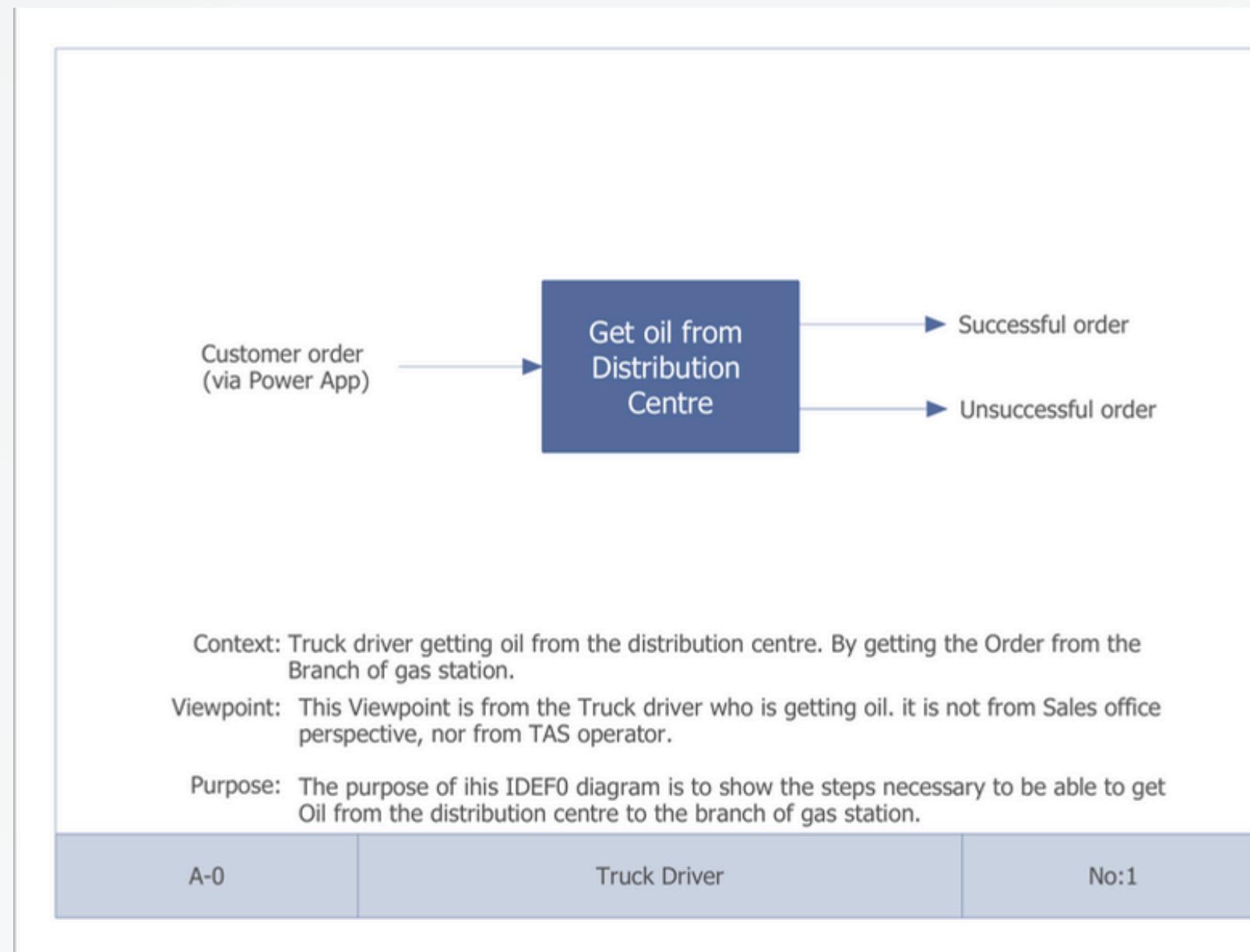
Creating the design; plans, drawings, and algorithms that describe what will be implemented.



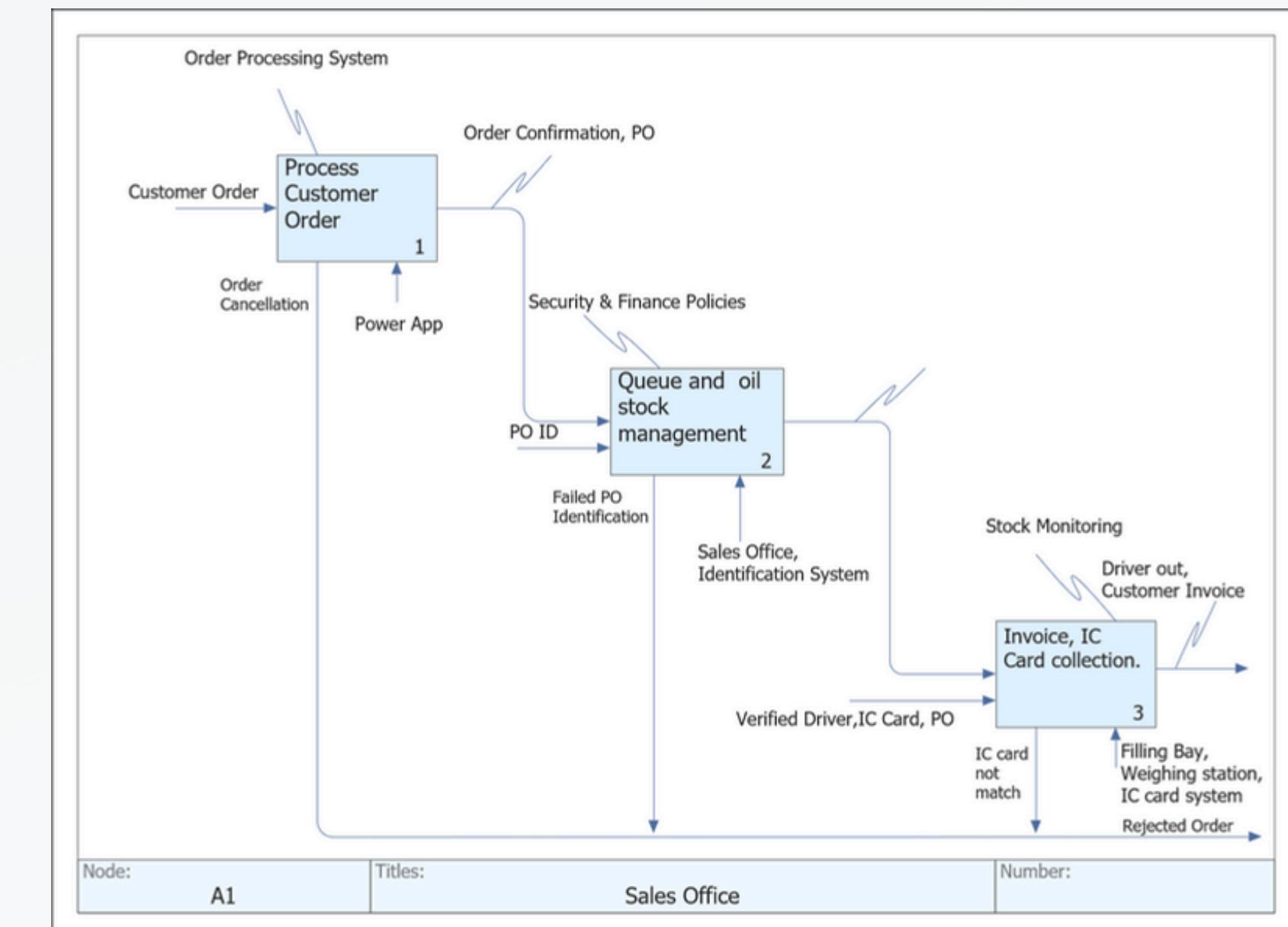
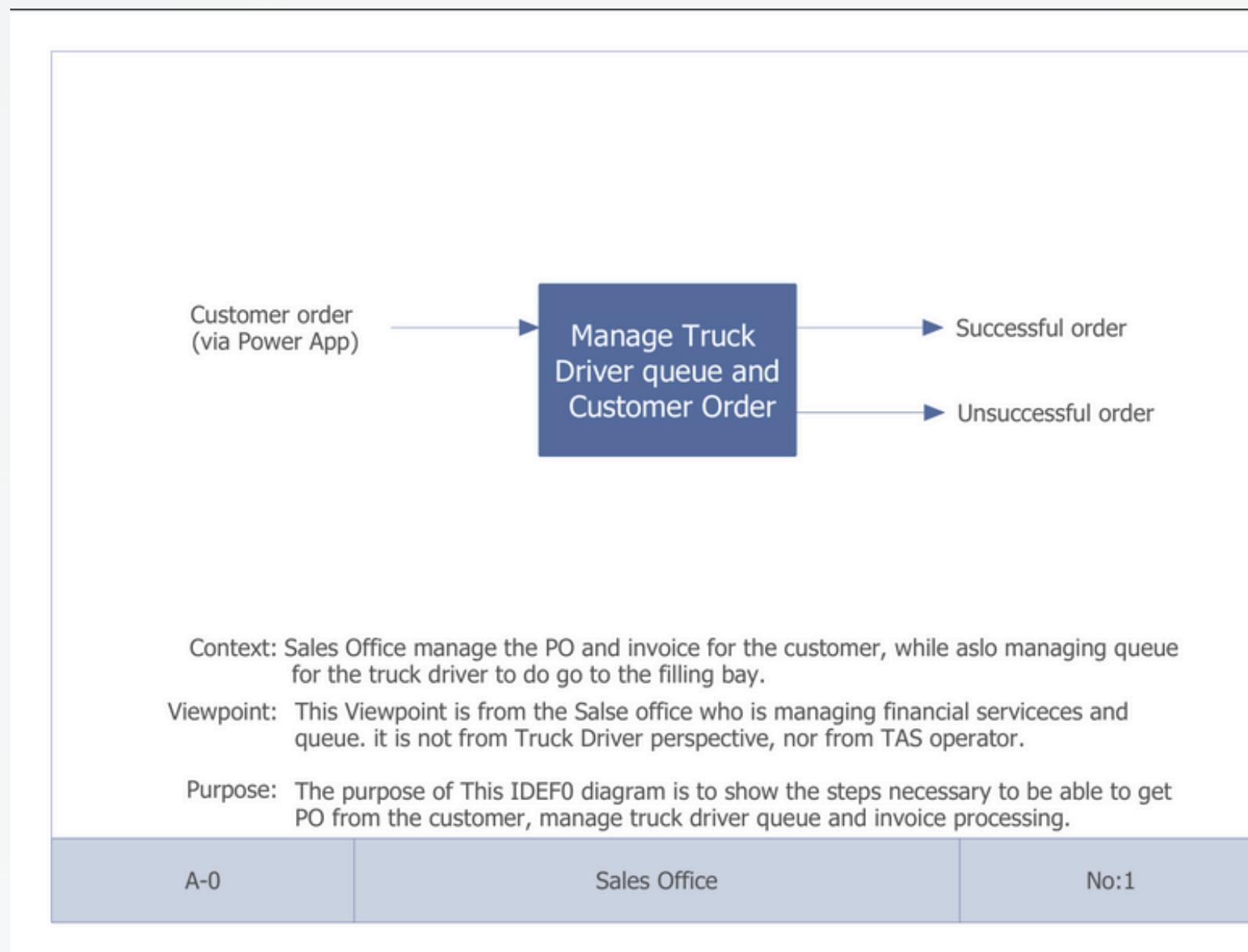
## 3rd Phase Implement Phase

Transforming the design into the product, including manufacturing, coding, testing and validation.

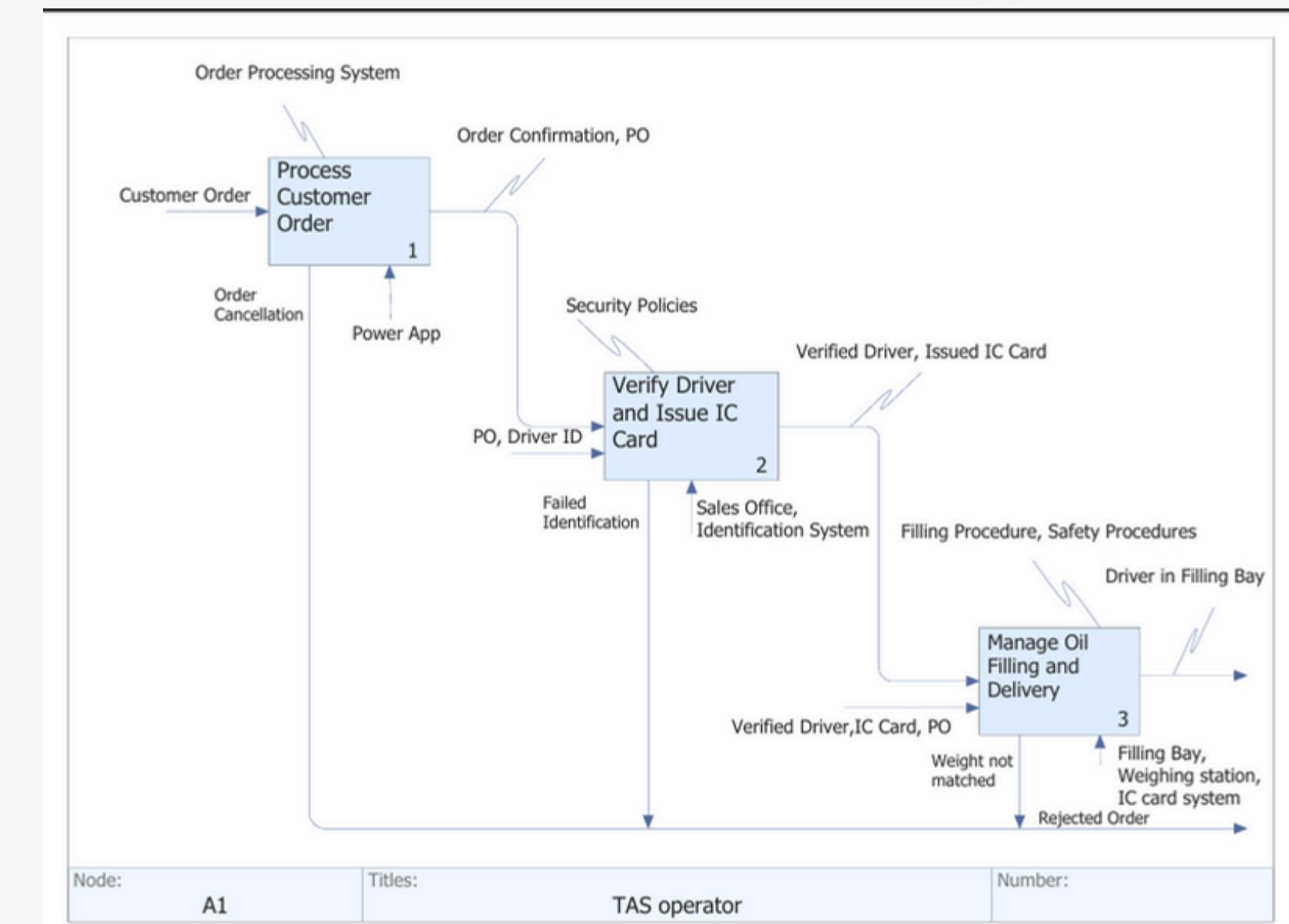
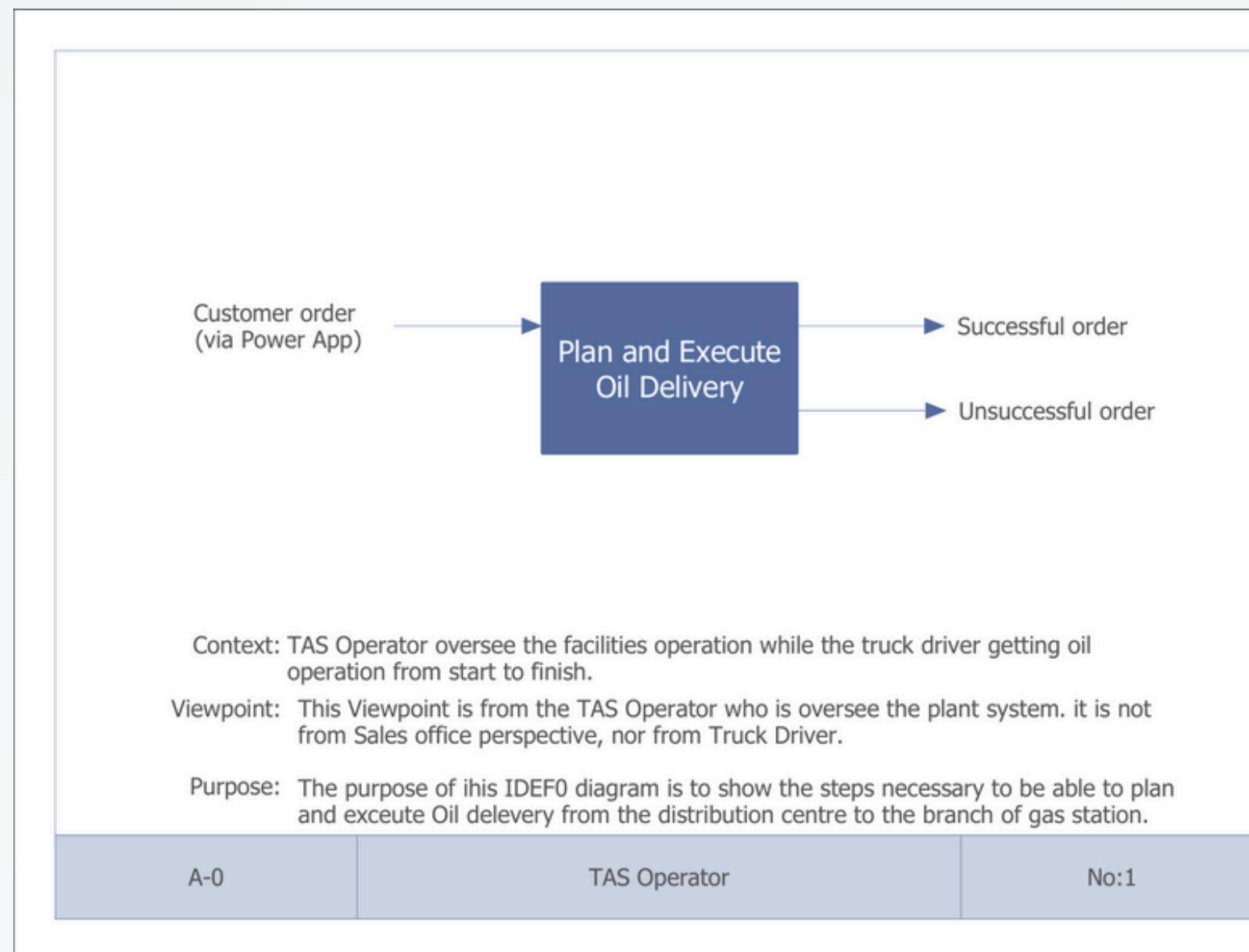
# IDEFO: DRIVER



# IDEFO: SALES OFFICE



# IDEFO: TAS OPERATOR



# Oil Distribution Centre

Group 2



King Mongkut's  
University of  
Technology  
Thonburi



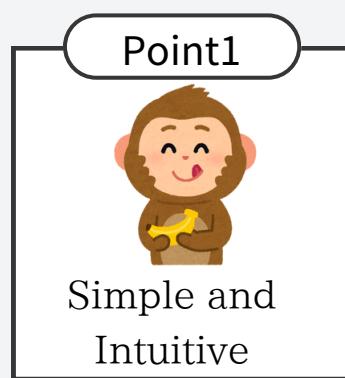
## Isn't it difficult to Order Your Oil Supply



## Financial Dashboard

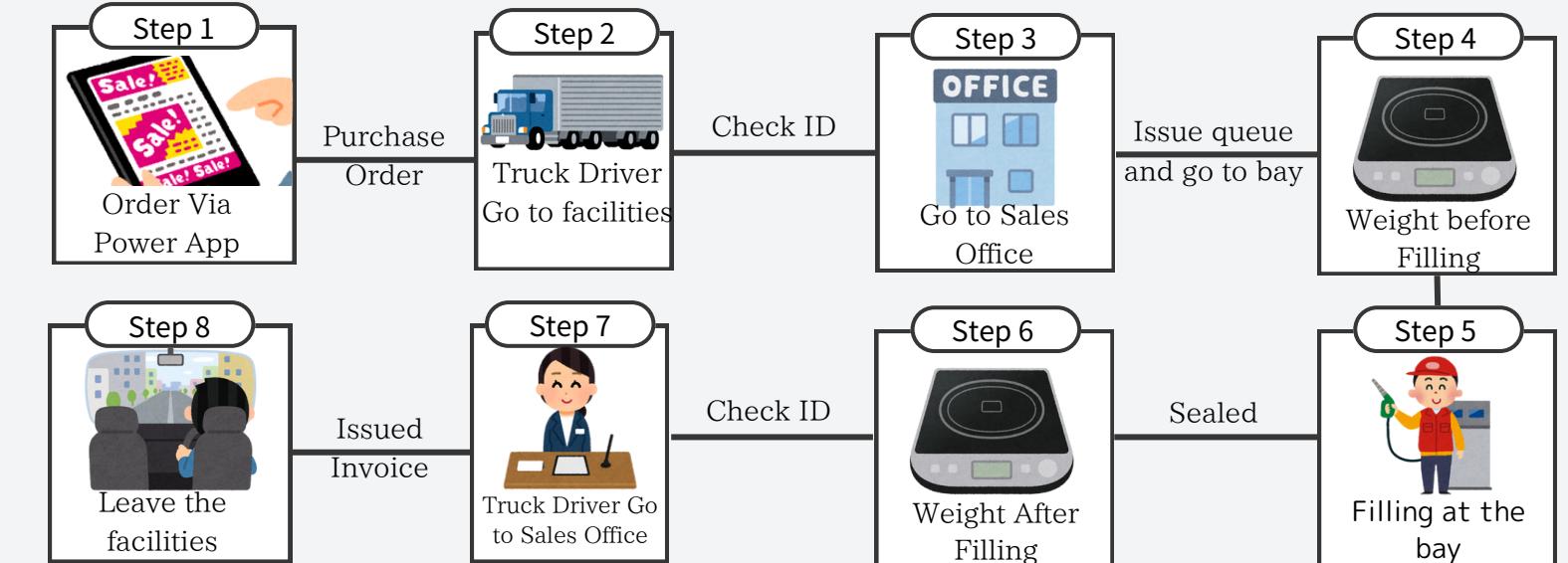


## Key Points and Potential Enhancements

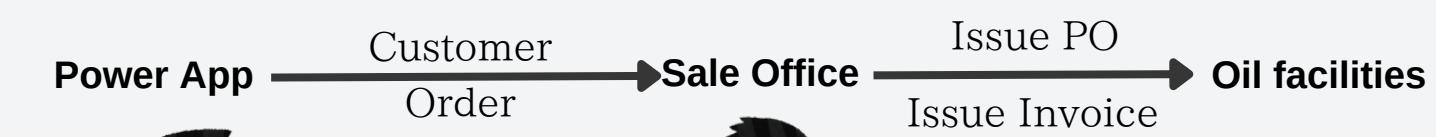


## Step to access facilities

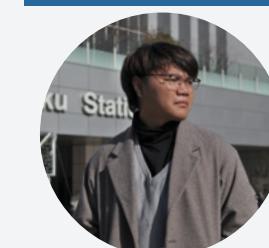
We create an automation Oil distribution system for easy access both from the operator and the customer



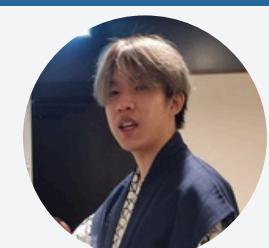
## How our system runs?



## Our Teams



Kunanon  
Project Manager  
Sawadmoon  
64070504005



Boonyarit Kerdswuan  
Data Analyst  
64070504008



Arnart Ngawsuwan  
Data Engineer(IT) / Data  
Analyst  
64070504017



Boon Hawaree  
Automation Engineer  
64070504024



Korim Akkaramanat  
Data Engineer (OT)  
64070504002

# Data Analyst

# DATA ANALYZE

DASHBOARD

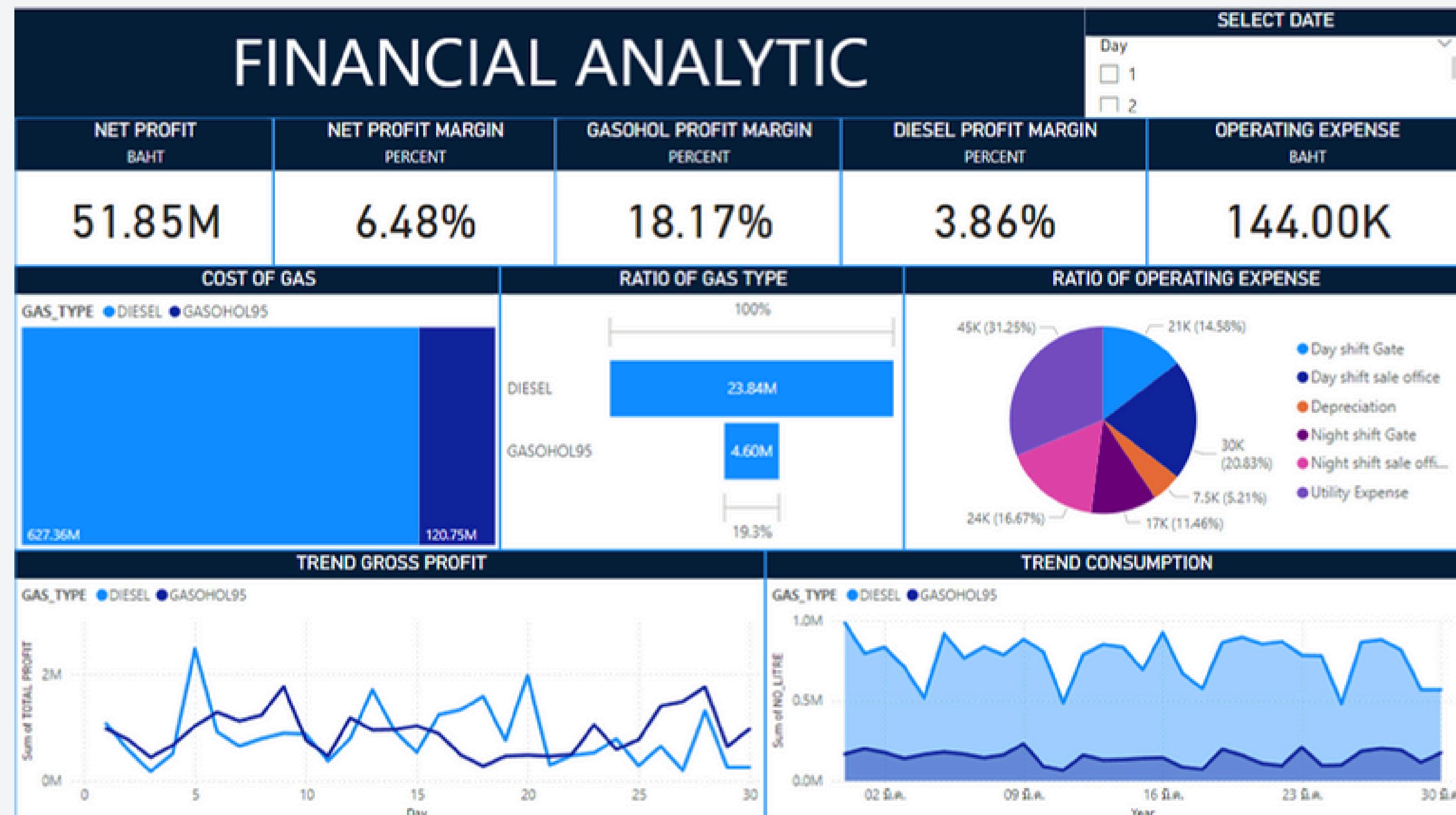


Analytic

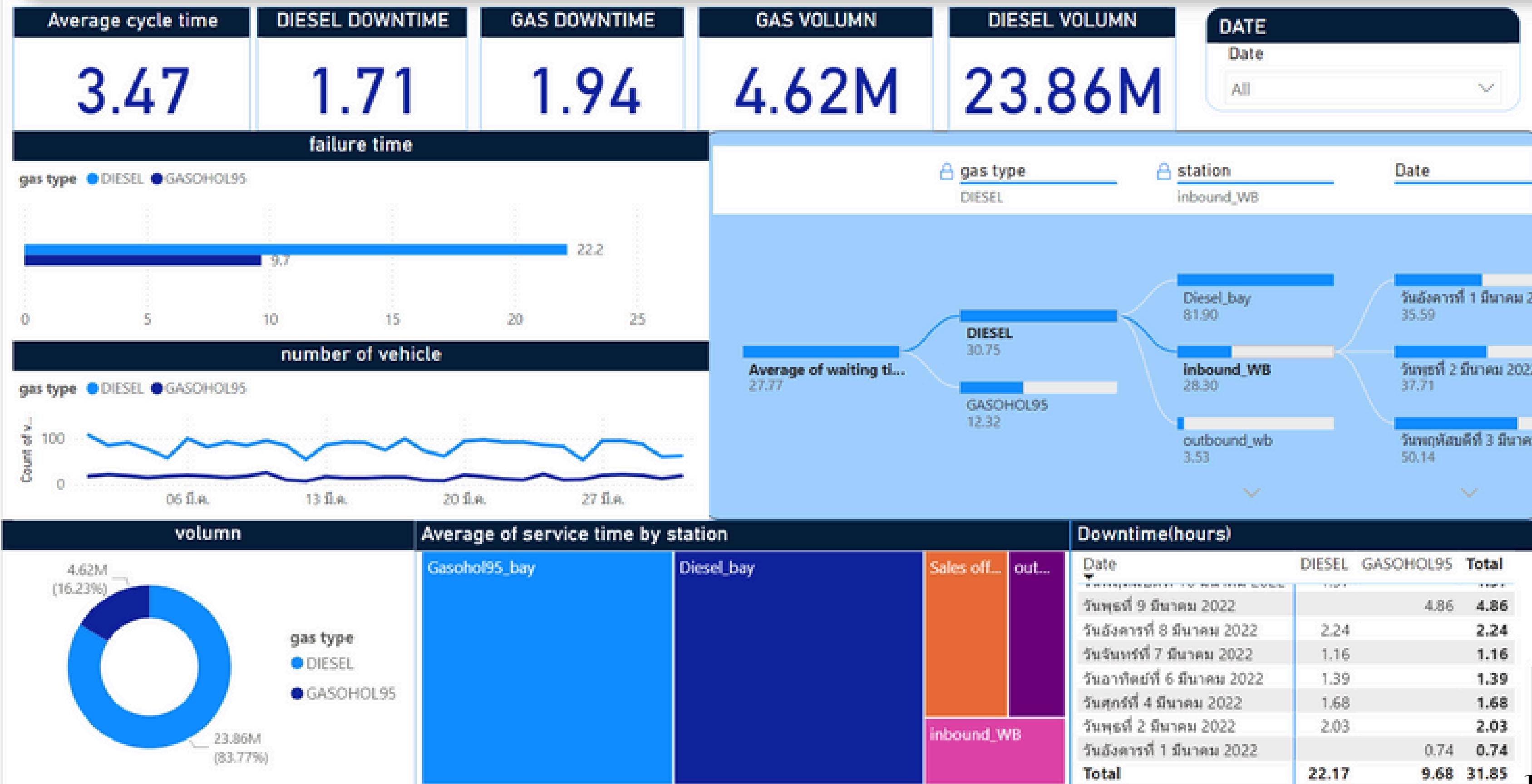


Presentation and  
Sharing





# Terminal Automation System Performance





# STATISTICS



## DIESEL



DIESEL CONSUMPTION  
23.84 ML

AVERAGE WEEKLY  
5.96 ML

## GASOHOL

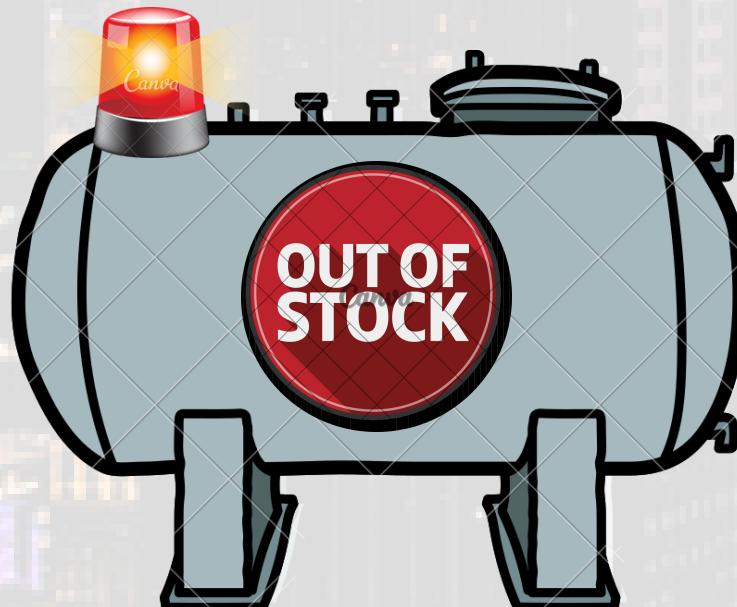


GASOHOL CONSUMPTION  
4.6 ML

AVERAGE WEEKLY  
1.15 ML

# PUCHASING OIL

## SAFETY STOCK

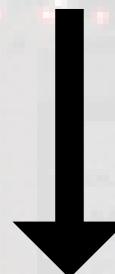


**GASOHOL95:**

**300,000 LITRE**

**DIESEL:**

**250,000 LITRE**



**GASOHOL95:**

**600,000 LITRE**

**GASOHOL95:**

**8 TIMES/MONTH**

**DIESEL:**

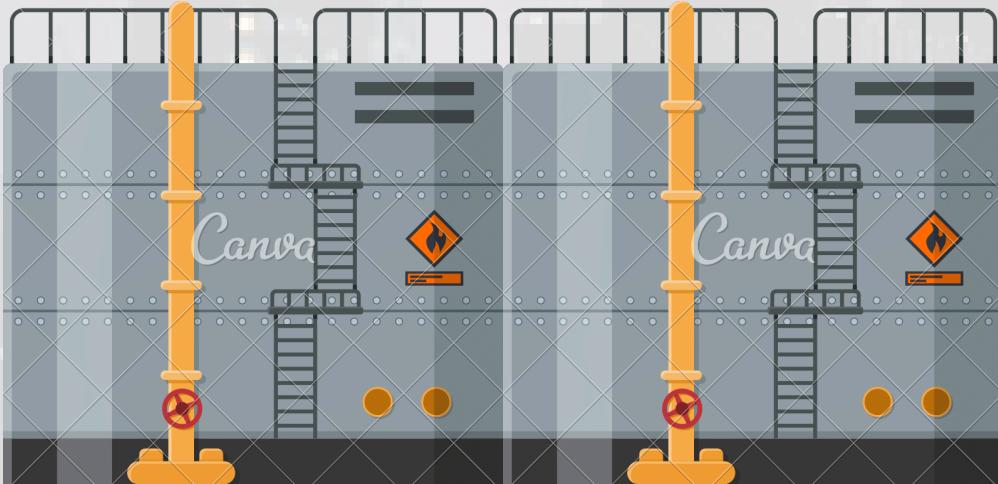
**2,000,000 LITRE**

**DIESEL:**

**12 TIMES/MONTH**

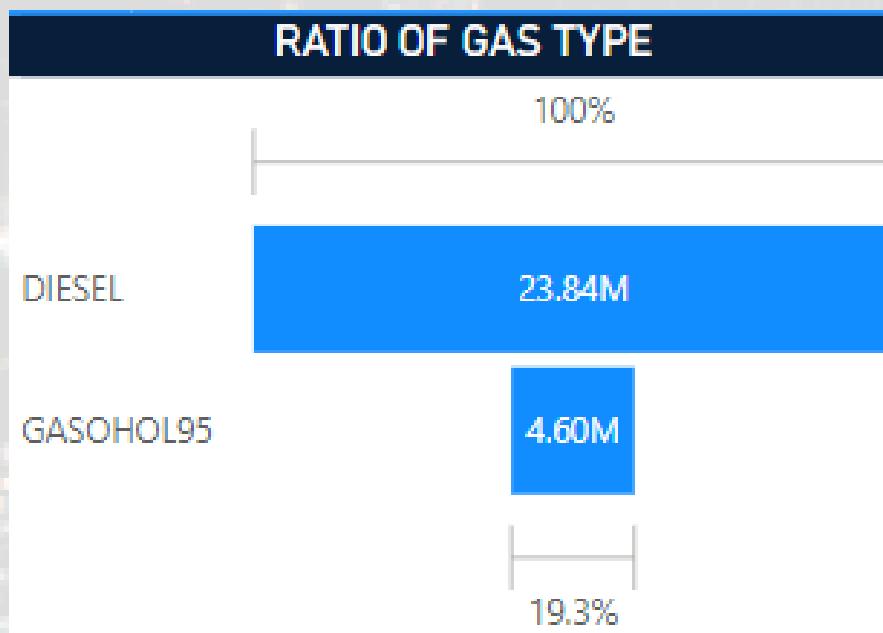
# PUCHASING OIL

## INVENTORY

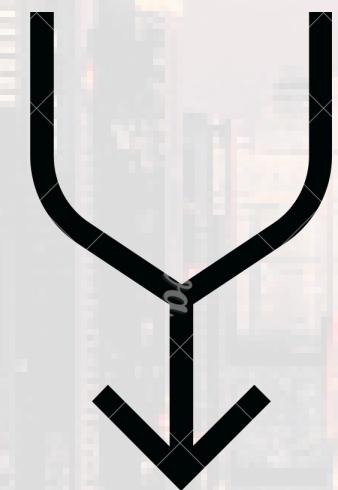


DIESEL CONSUMPTION  
23.84 ML

GASOHOL CONSUMPTION  
4.6 ML



TOTAL 28.44 MILLION LITRE



ORDER 30-35 MILLION LITRE

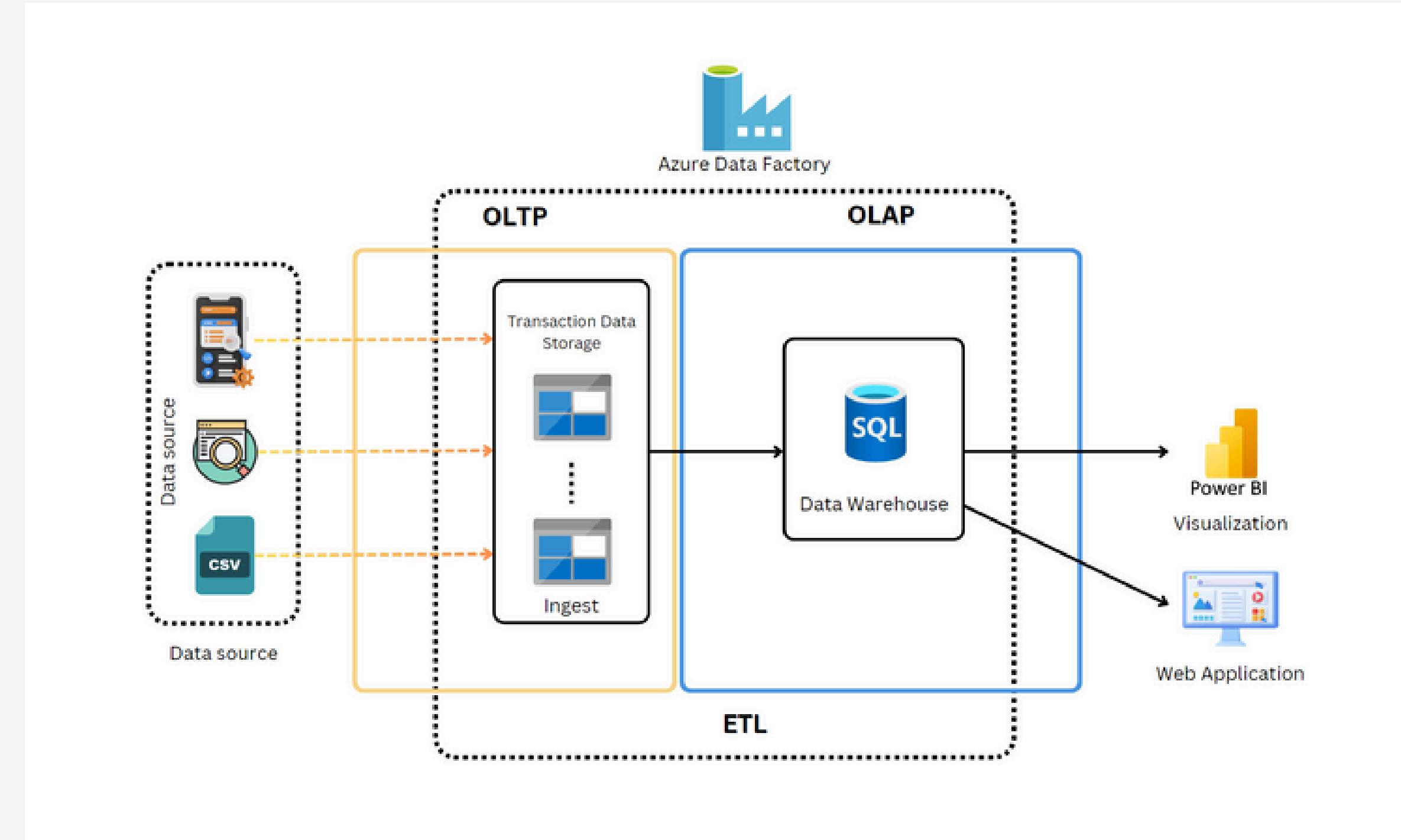
IT

# 6 PAGES FINANCIAL REPORT

**INC372 - Financial Report**

-  **General Journal**  
Click to View at Each Day
-  **General Ledger**  
Click to View at Each Account
-  **Monthly Income Statement**  
Click to View at Each Month
-  **Inventory Stock Card**  
Click to View at Each Month
-  **Purchase Order**  
Click to View More
-  **Invoice**  
Click to View More

# AZURE DATA DESIGN



# AZURE SERVER AND DATABASE

Home > inc372-g2 > minipro372-g2-server >

 minipro372-g2-db (minipro372-g2-server/minipro372-g2-db) ⚡ ⚡ ... X

SQL database

Copy Restore Export Set server firewall Delete Connect with... Feedback

Overview Activity log Tags Diagnose and solve problems Query editor (preview) Settings Compute + storage

Overview Activity log Tags Diagnose and solve problems Query editor (preview) Settings Compute + storage

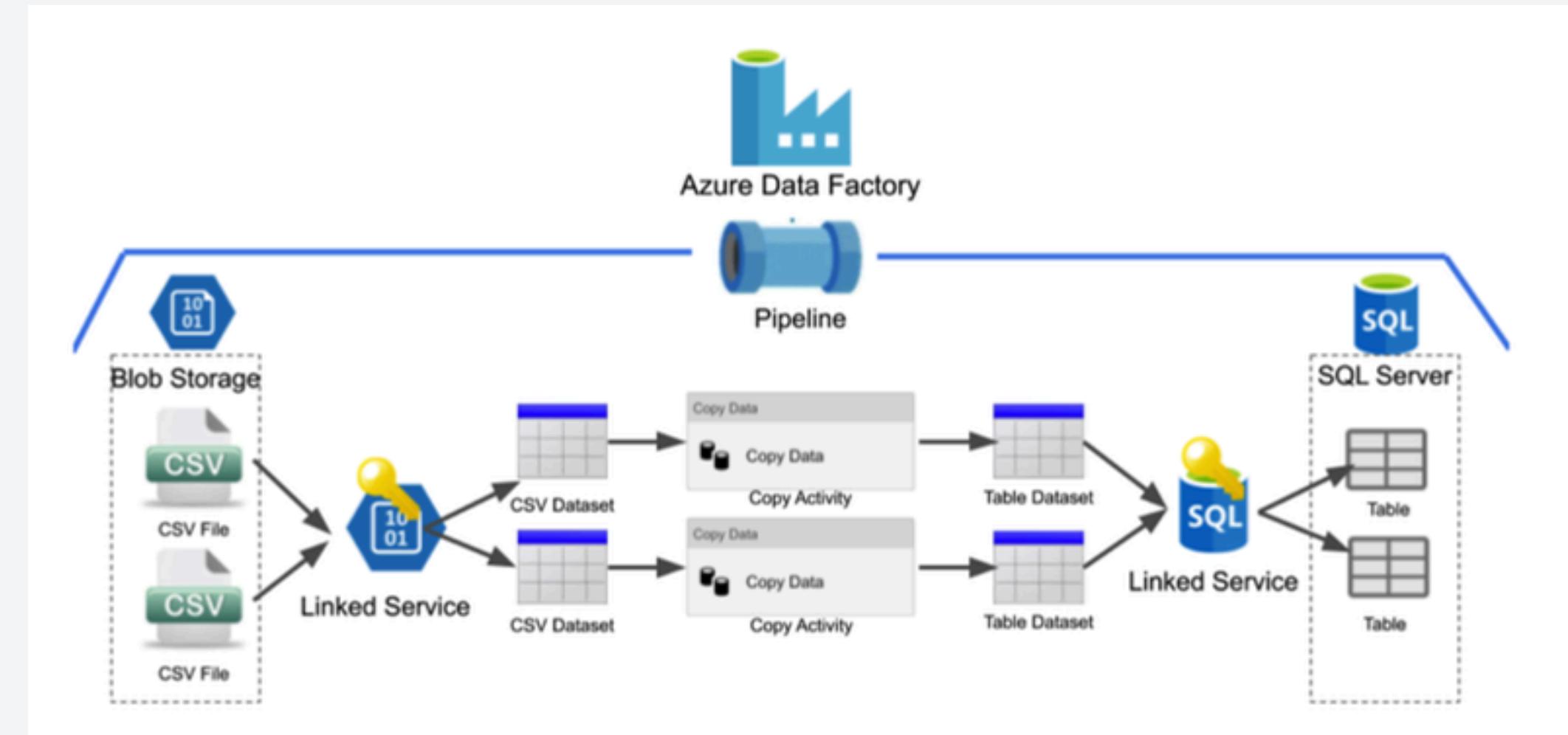
~ Essentials

Resource group ( <a href="#">move</a> )	:	inc372-g2	Server name	:	<a href="#">minipro372-g2-server.database.windows.net</a>
Tags	:	Online	Connection strings	:	<a href="#">Show database connection strings</a>
Diagnose and solve problems	:	Southeast Asia	Pricing tier	:	<a href="#">General Purpose - Serverless: Gen5, 1 vCore</a>
Query editor (preview)	:	<a href="#">Azure for Students</a>	Auto-pause delay	:	<a href="#">1 hour</a>
Subscription ID	:	23b88d42-b557-40b7-80cb-43565ec0da23	Earliest restore point	:	2024-05-25 02:51 UTC

[Tags \(edit\)](#) [Add tags](#)

JSON View

# AZURE DATA FACTORY DATA PIPELINE



<https://medium.com/@jwbtmf/step-by-step-data-transformation-with-azure-data-factory-210a4ff84fd>



# QUERY EDITOR

The screenshot shows the Azure Data Studio Query editor interface. The title bar reads "minipro372-g2-db (minipro372-g2-server/minipro372-g2-db) | Query editor (preview)". The left sidebar displays a database tree for "minipro372-g2-db (miniprogroup2)", with the "dbo.Finance" table selected. A message box indicates "Showing limited object explorer here. For full capability please click here to open Azure Data Studio." The main area contains two tabs: "Query 1" and "Query 2", with "Query 2" active. The query text is: "1 SELECT TOP (1000) \* FROM [dbo].[Finance]". The results tab shows a table with columns: CustomerID, SHIPMENT\_NUMBER, PO\_Num, Datetime, and G. The data returned is as follows:

CustomerID	SHIPMENT_NUMBER	PO_Num	Datetime	G
9563200	2203011768	7007392288	2022-03-01 00:04:06.0000000	G
9563201	2203011770	7007392290	2022-03-01 00:04:48.0000000	D
9563202	2203011771	7007392291	2022-03-01 00:05:28.0000000	D
9563203	2203011772	7007384547	2022-03-01 00:06:24.0000000	D
9563204	2203011773	7007392292	2022-03-01 00:07:14.0000000	D

The status bar at the bottom right says "Query succeeded | 0s".

OT

# PI SYSTEM

**01**  
Overview

**02**  
PI Asset  
Framework

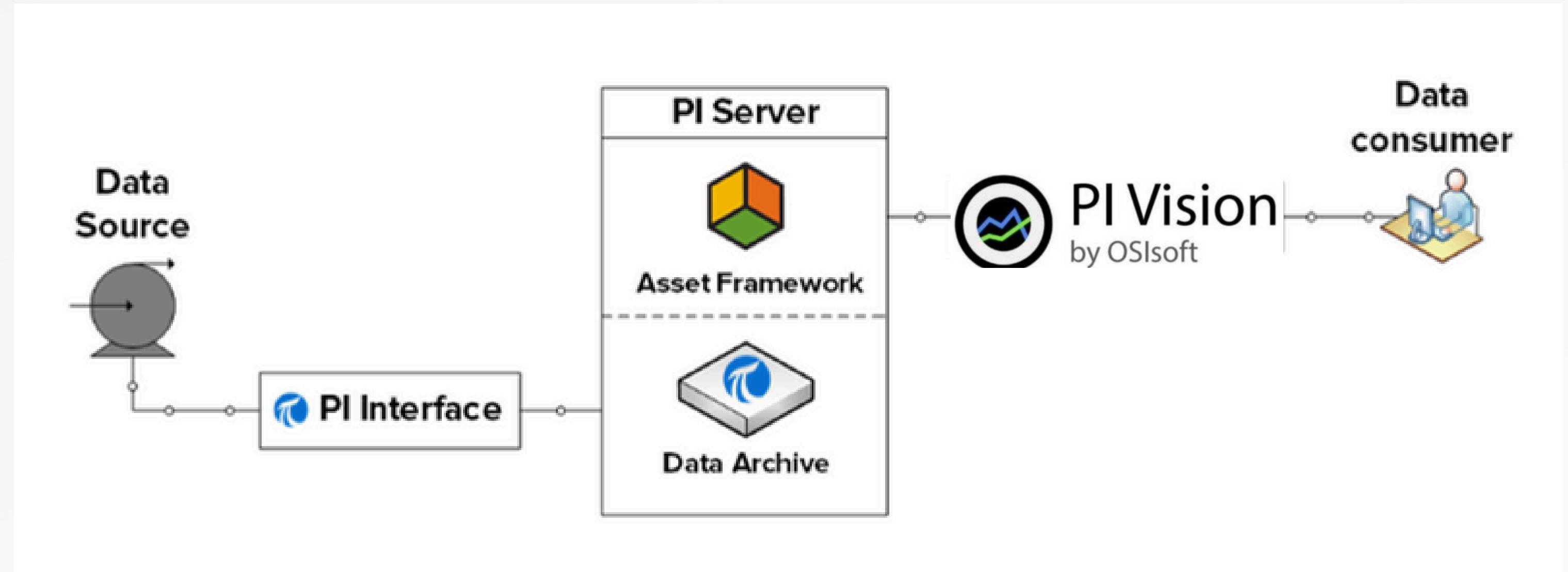
**03**  
PI Data Archive

**04**  
PI Datalink

**05**  
PI Vision



# PI SYSTEM OVERVIEW

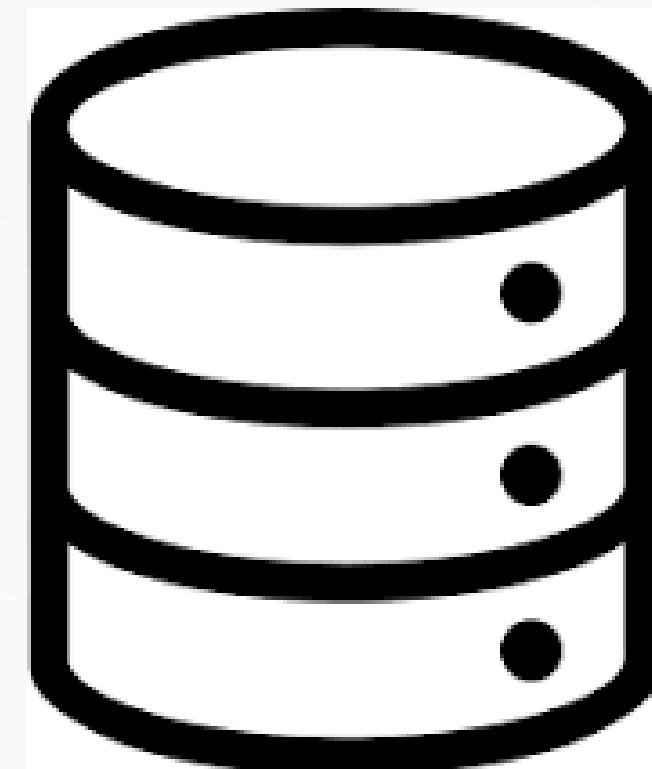


# PI ASSET FRAMEWORK

**PI AF represents organizational assets and equipment, providing context to your time-series data.**

**PI AF uses a multi-tiered architecture. A minimal system consists of three tiers:**

- PI AF SDK a programming libraries.
- The PI AF Application Service
- The PI AF SQL database



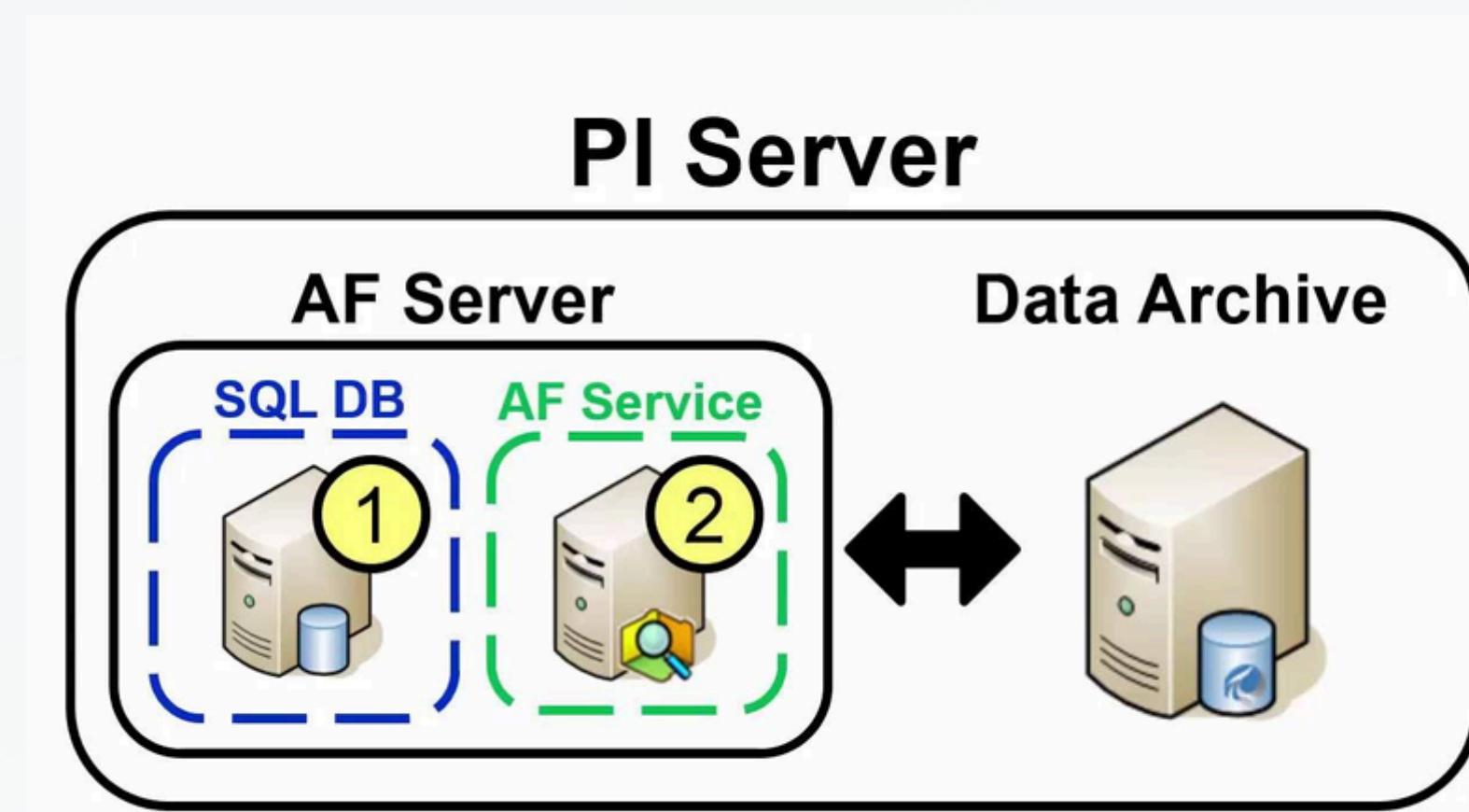
# PI ASSET FRAMEWORK

Group2_64			None
Entrance Gate			None
Exit Gate			None
Inbound Weight Station			None
O01			None
RFID003			None
Weight Sensor 1			None
S01			None
Loading Bay			None
Diesel1			None
O01			None
P001			None
RFID004			None
S01			None
DI001			None
FT001			None
PT001			None
TT001			None
XV001			None
Diesel2			None
O01			None
S01			None
Diesel3			None
O01			None
S01			None
Diesel4			None
Gasohol1			None
Gasohol2			None
Outbound Weight Station			None
Tank Farm			None

Group2_64			None
Entrance Gate			None
Exit Gate			None
Inbound Weight Station			None
Loading Bay			None
Outbound Weight Station			None
Tank Farm			None

# PI DATA ARCHIVE

**PI Data Archive is one of the most significant components of the PI System. The Archive is where timestamped measurements of plant process information such as pressures, flows, temperatures, setpoints, on/offs are stored.**



# PI DATA ARCHIVE

Merge Type: Replace Duplicates Boundary Type: Inside  
Show Filtered: Show Filtered  Use String Annotations?  
Filter Expression:

	Value	Event Time	Questionable	Annotated	Substituted
1	201.716099303084	26/05/2024 02:17:40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	207.240476802569	26/05/2024 02:17:40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	207.812568106601	26/05/2024 02:17:45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	198.28117376579	26/05/2024 02:17:50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	205.10844412032	26/05/2024 02:17:55	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	204.826763893863	26/05/2024 02:18:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	191.702336315858	26/05/2024 02:18:05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	196.057775852297	26/05/2024 02:18:10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	203.355939999854	26/05/2024 02:18:15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	195.184213074476	26/05/2024 02:18:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	196.038134110178	26/05/2024 02:18:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	198.503891811009	26/05/2024 02:18:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	201.241277731602	26/05/2024 02:18:35	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	206.605943728521	26/05/2024 02:18:40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	200.412489739439	26/05/2024 02:18:45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	190.257813930632	26/05/2024 02:18:50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	209.801182607096	26/05/2024 02:18:55	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	201.591323042098	26/05/2024 02:19:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	203.927568958107	26/05/2024 02:19:05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	202.069302625986	26/05/2024 02:19:10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	195.510087062377	26/05/2024 02:19:15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	206.665484195885	26/05/2024 02:19:20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Session Record

KORIMPC\Asus group2

# PI DATALINK

**PI DataLink is a Microsoft Excel add-in that enables you to retrieve information from your PI System directly into a spreadsheet.**

## The used of PI Datalink

- Retrieve PI point and AF attribute values.
- Retrieve system metadata to create a structured view of PI data.
- Reference items using PI DataLink functions to calculate and filter data.
- Keep values updated when the spreadsheet recalculates.
- Retrieve PI Event Frames.
- Retrieve PI Notifications to which you are subscribed.

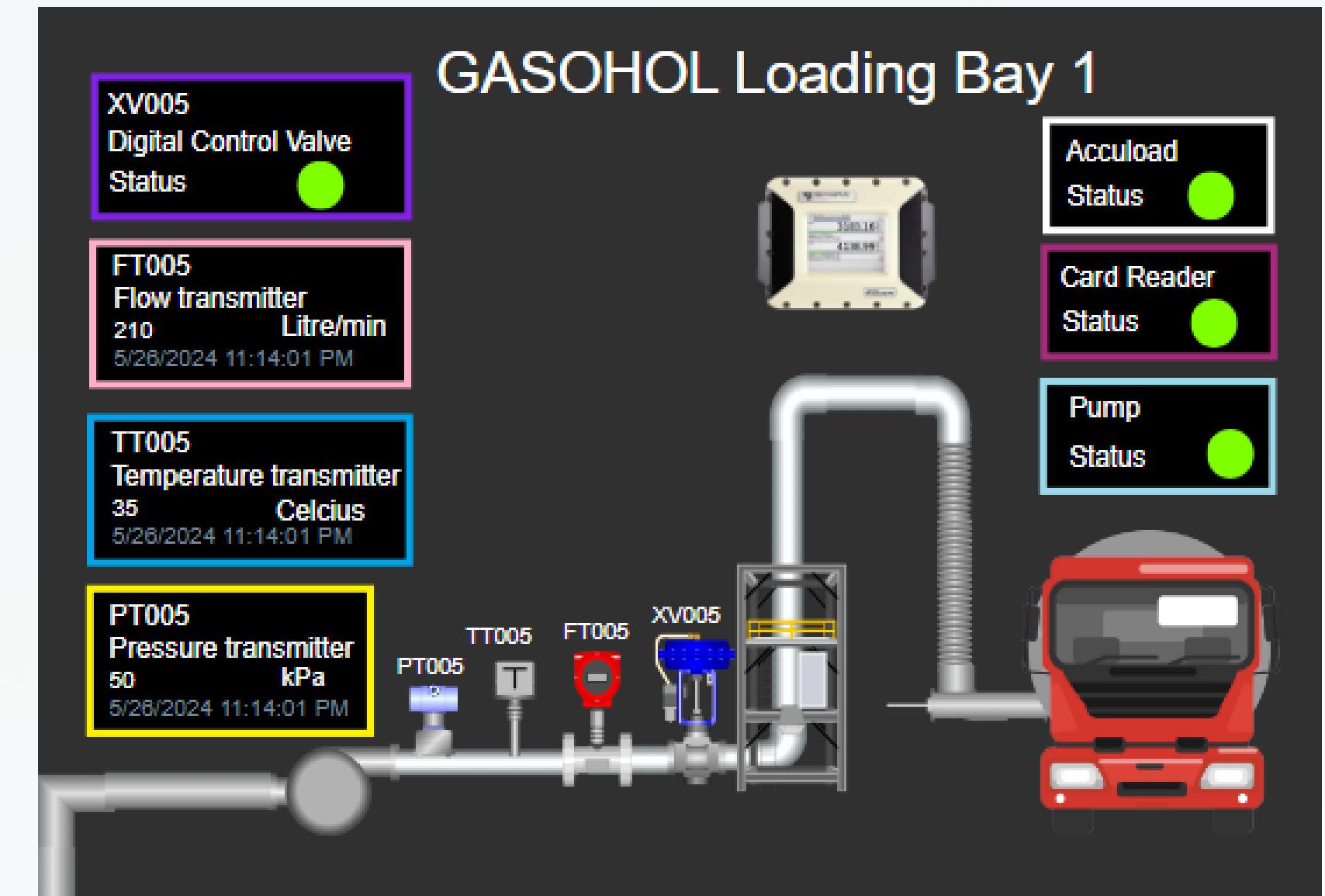
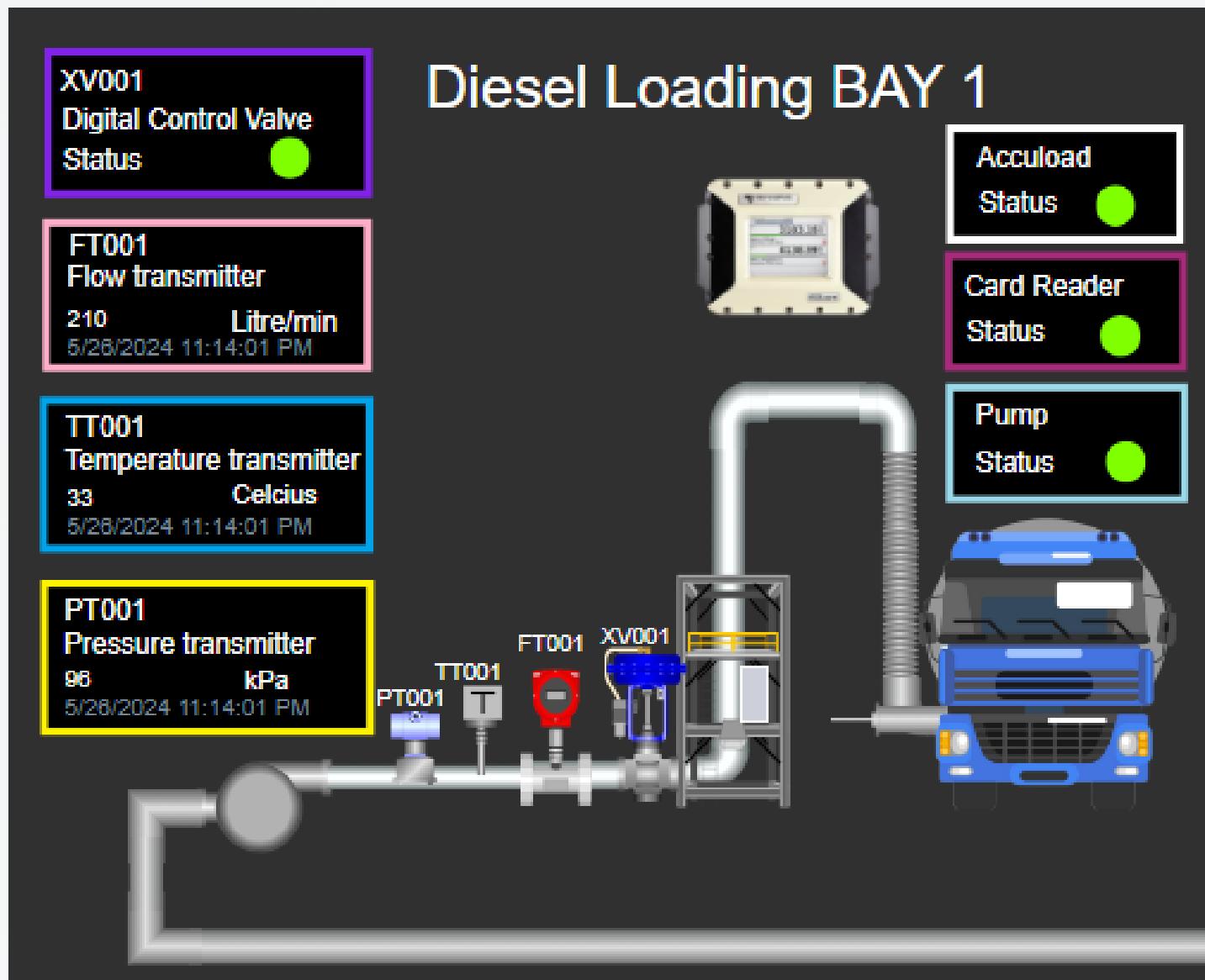
# PI VISION

**PI Vision is a web visualization tool which can take in your real-time data and display them.**  
**PI Vision gives quick and easy ways to share display and performed ad-hoc analysis.**

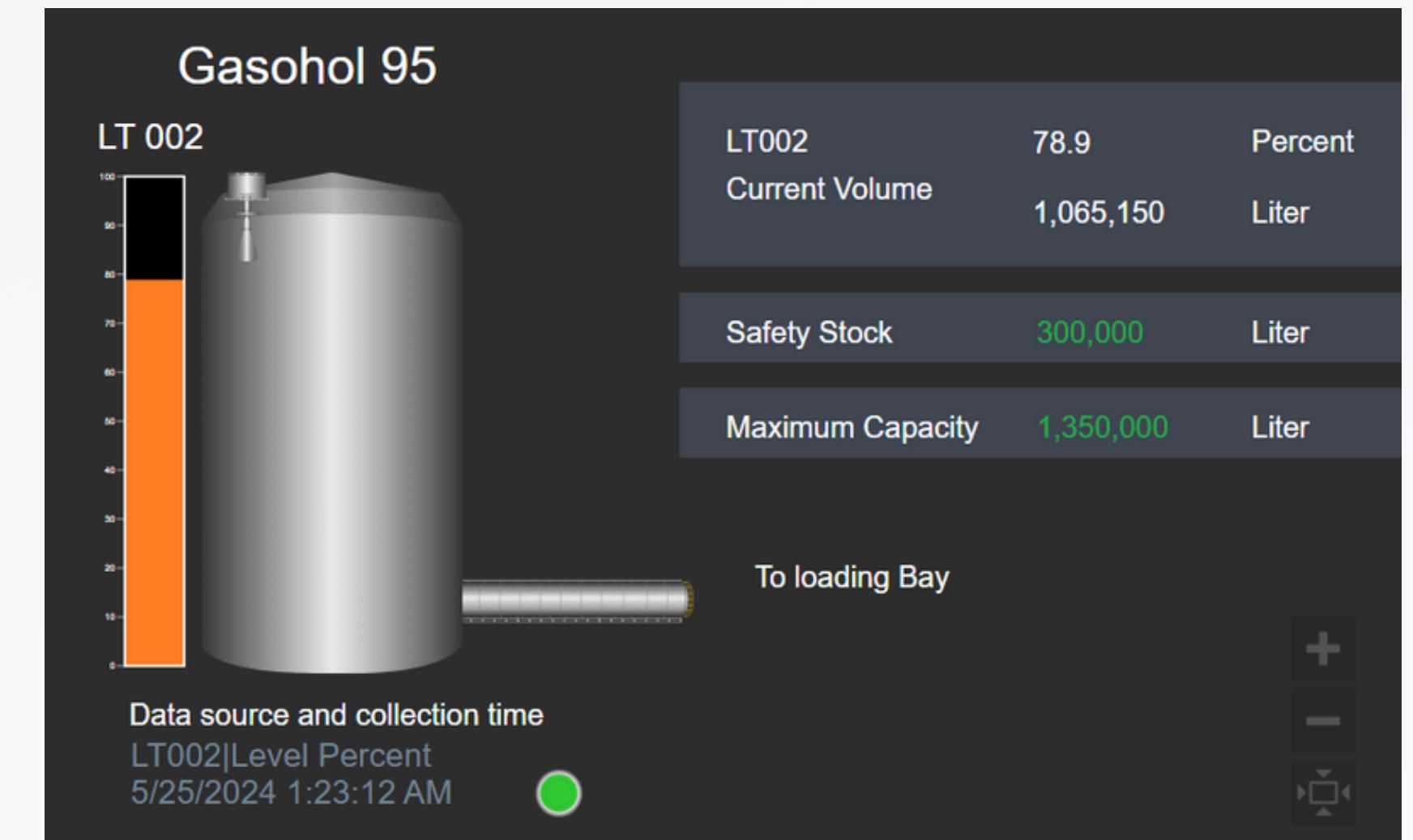
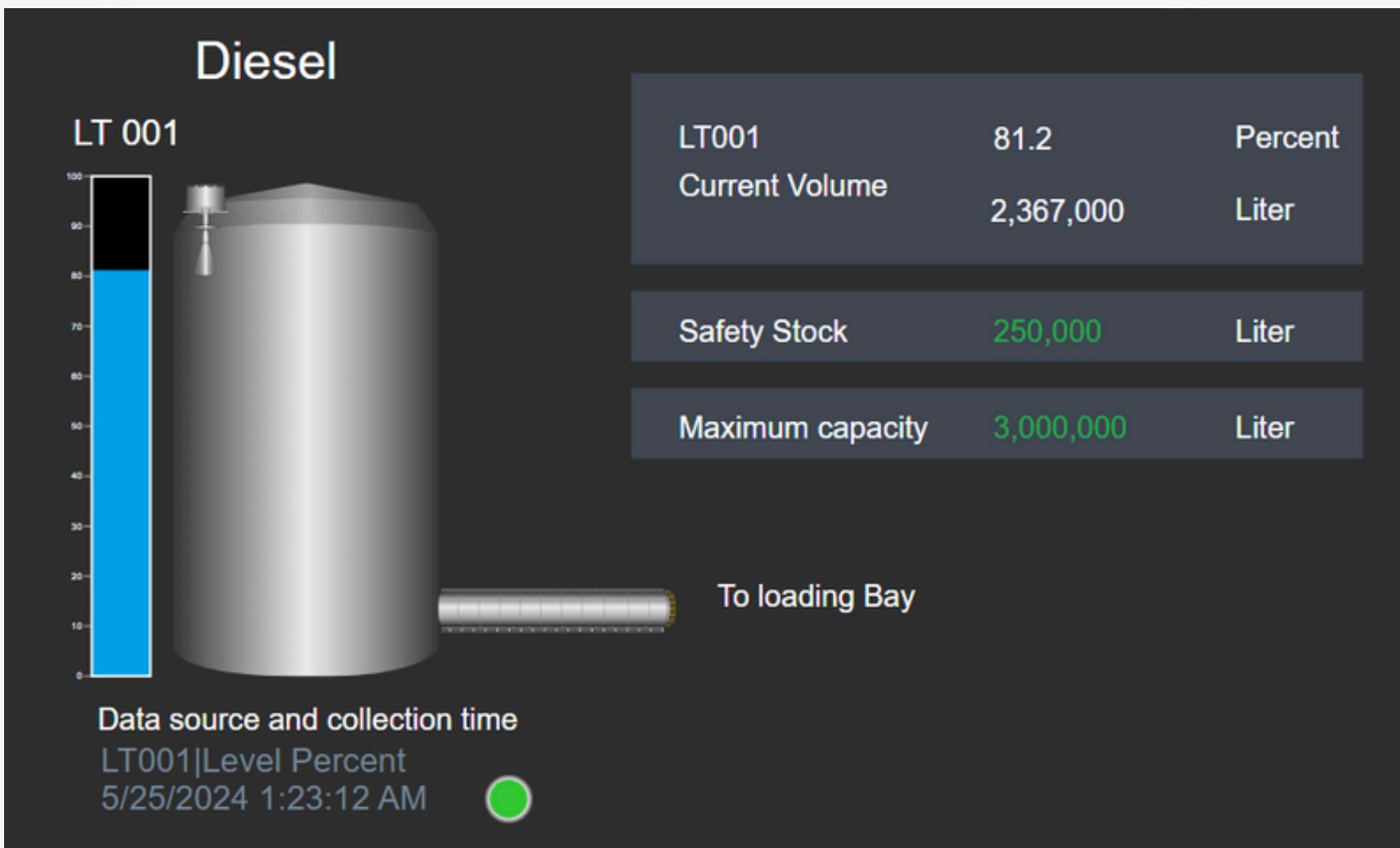


**PI Vision**  
by OSIsoft

# PI VISION

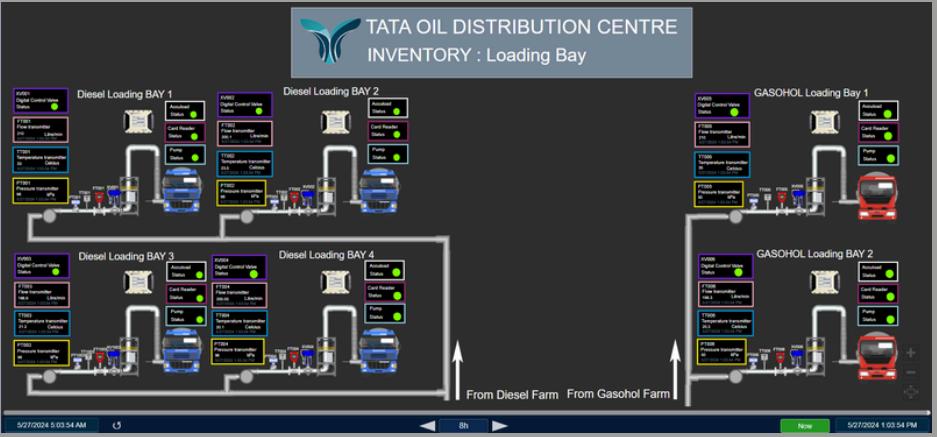


# PI VISION



# Automation

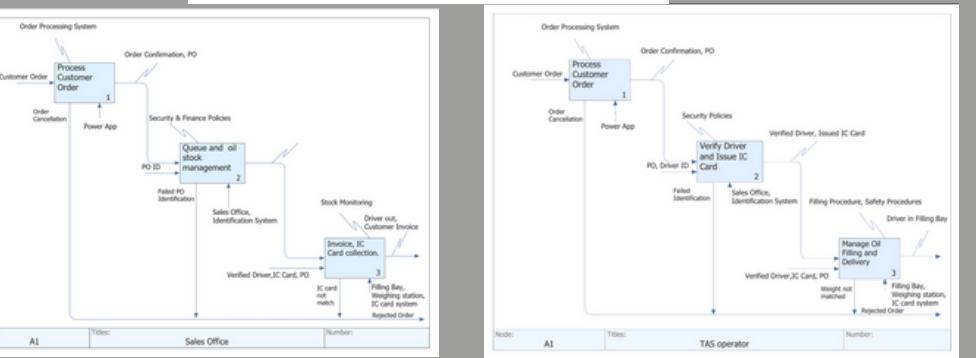
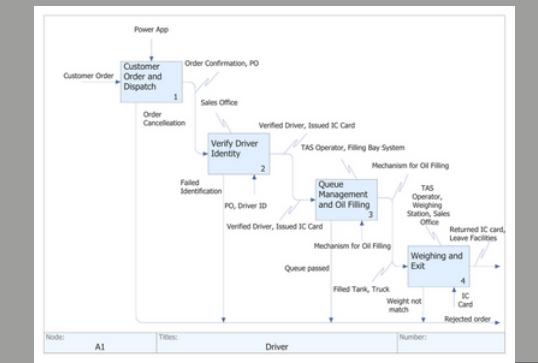
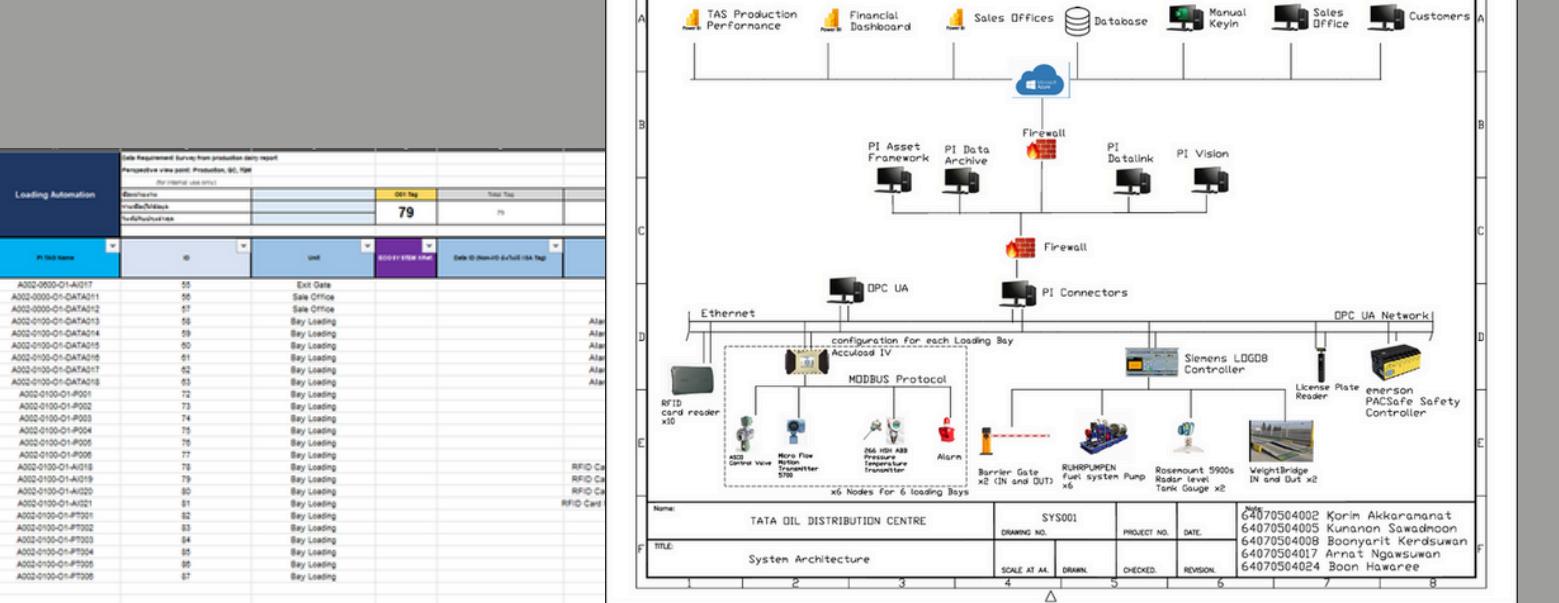
# WORKING FLOW



## OPERATOR DASHBOARD

Data requirement survey from production area report		
Perspective view point: Production, QC, HRM		
For whom use this:		
PI Tag Name	Unit	SDO ID / Value / Unit / Tag
A002-000-01-PT017	55	Exit Gate
A002-010-01-PT011	56	Sale Office
A002-010-01-PT012	57	Sale Office
A002-010-01-PT013	58	Bay Loading
A002-010-01-PT014	59	Bay Loading
A002-010-01-PT015	60	Bay Loading
A002-010-01-PT016	61	Bay Loading
A002-010-01-PT017	62	Bay Loading
A002-010-01-PT018	63	Bay Loading
A002-010-01-PT001	72	Bay Loading
A002-010-01-PT002	73	Bay Loading
A002-010-01-PT003	74	Bay Loading
A002-010-01-PT004	75	Bay Loading
A002-010-01-PT005	76	Bay Loading
A002-010-01-PT006	77	Bay Loading
A002-010-01-PT019	78	Bay Loading
A002-010-01-PT020	79	Bay Loading
A002-010-01-PT021	80	Bay Loading
A002-010-01-PT022	81	Bay Loading
A002-010-01-PT023	82	Bay Loading
A002-010-01-PT024	83	Bay Loading
A002-010-01-PT025	84	Bay Loading
A002-010-01-PT026	85	Bay Loading
A002-010-01-PT027	86	Bay Loading
A002-010-01-PT028	87	Bay Loading

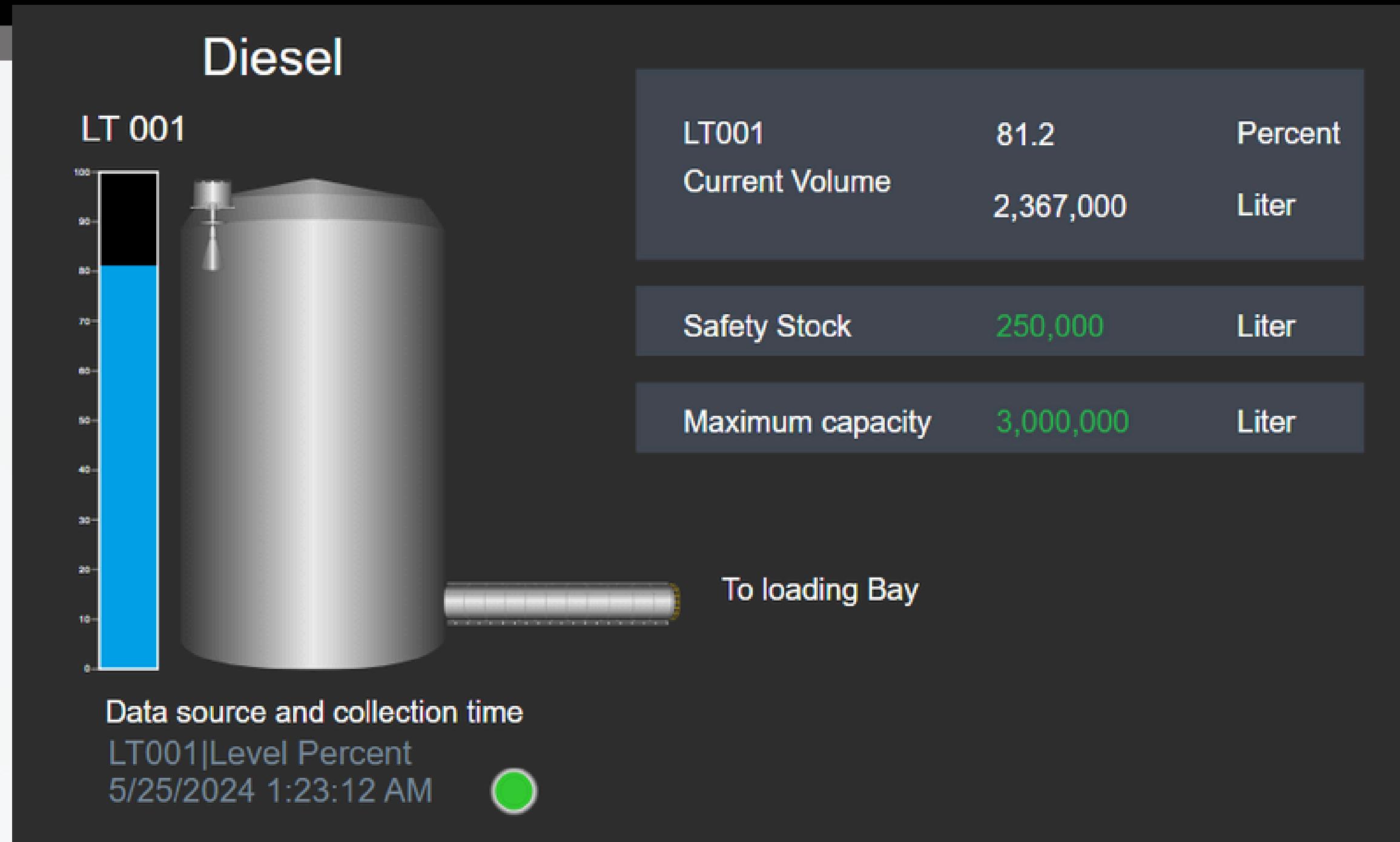
## PI-TAG DESIGN + SYSTEM ARCHITECT



IDEFO

34

# INSTRUMENT DESIGN: TANK FARM

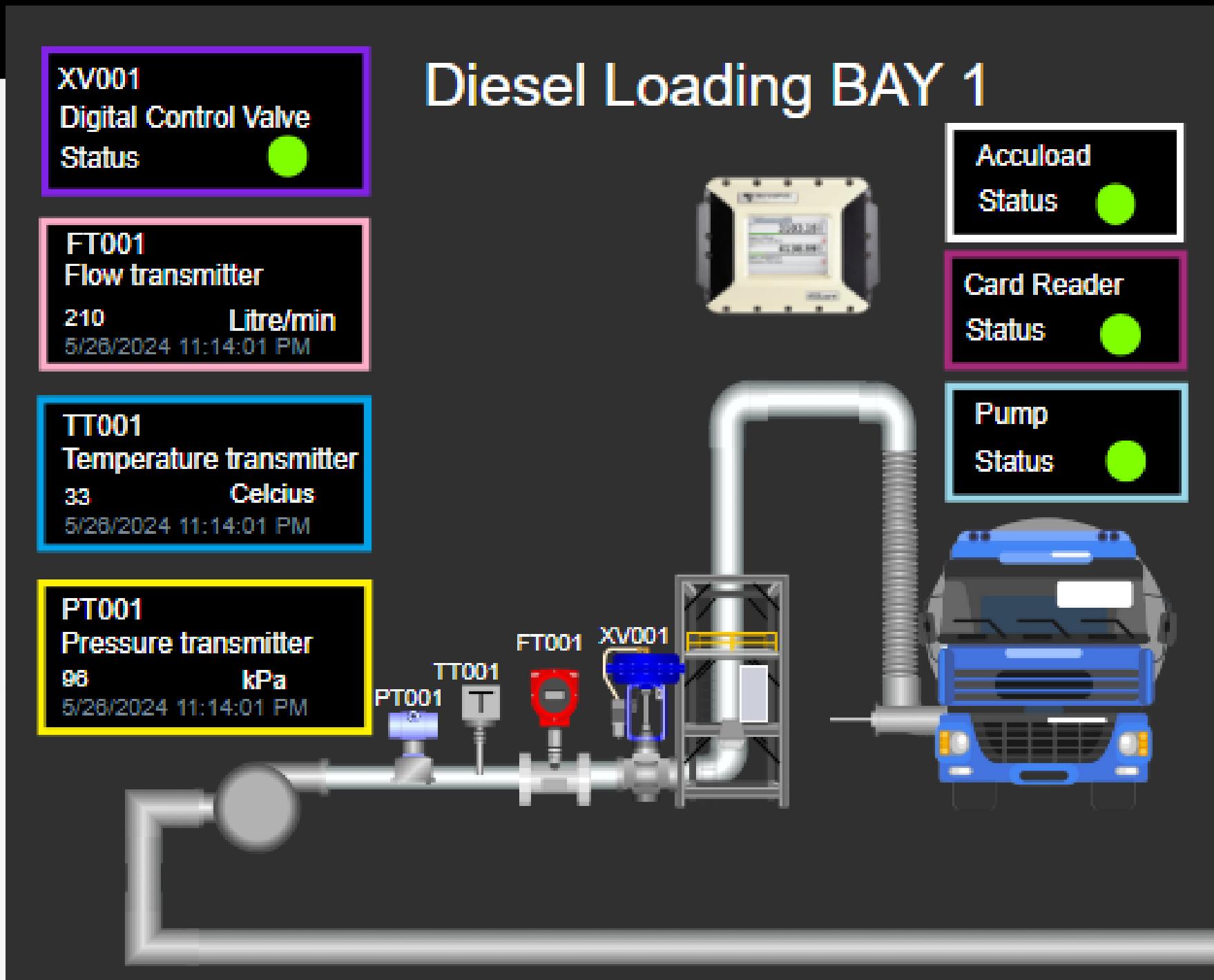


INVENTORY PLANNING  
FROM HISTORICAL DATA



BRING UP DATA TO DISPLAY

# INSTRUMENT DESIGN : LOADING BAY



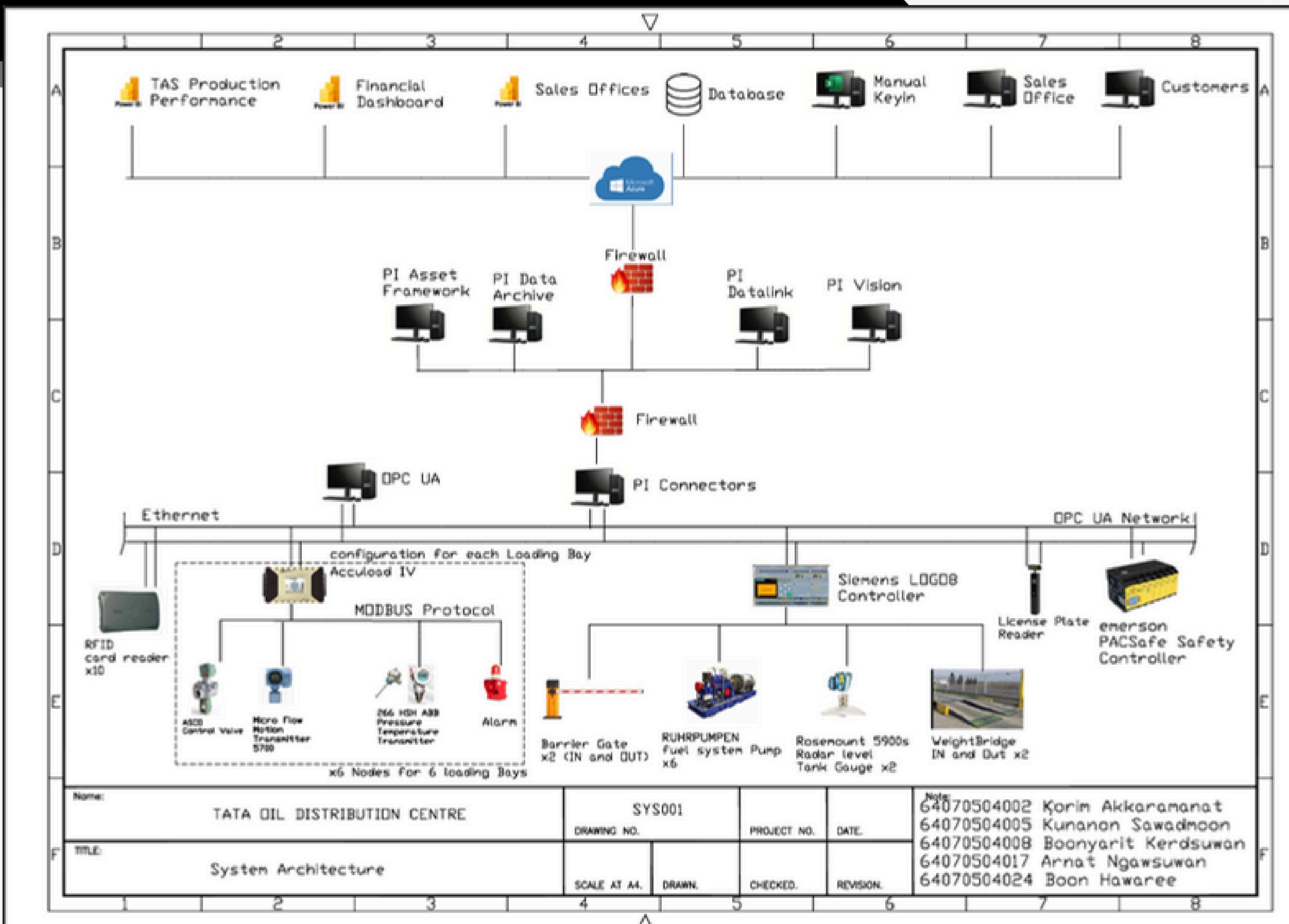
## BOTTOM LOADING ARM

- Faster connection
- Safety
- Environmental Friendly

## CRUCIAL CONTROL PARAMETER

- Pressure
- Temperature
- Flow

# SYSTEM ARCHITECT



# PI TAG

Loading Automation		Data Requirement Survey from production daily report										Data priority scoring	
		Perspective view point: Production, GIC, 1000 (for internal use only)		PI Tag		Total Tag		Other Tag		001			
Dashboard	Metrics/Metrics	79	79	0	0	0	0	0	0	0	0	0	0
Historical data												Data Description	
PI Tag Name	ID	Unit	Entity Type	Data ID (Physical & Virtual Tag)	Description	Sampling	Units	Data Life time	MSL	Controller/Meter			
A002-0000-O1-A0017	55	Exit Gate			Counter Number Out	1 min	minute	1 Year		X			
A002-0000-O1-DATA011	56	Sale Office			TruckID	1 min	truck	1 Year	X	X			
A002-0000-O1-DATA012	57	Sale Office			PONumber	1 min	number	1 Year	X	X			
A002-0100-O1-DATA013	58	Bay Loading			Alarm Power Failed -Dispenser1	1 min	OK/Alarm	1 Year		X			
A002-0100-O1-DATA014	59	Bay Loading			Alarm Power Failed -Dispenser2	1 min	OK/Alarm	1 Year		X			
A002-0100-O1-DATA015	60	Bay Loading			Alarm Power Failed -Dispenser3	1 min	OK/Alarm	1 Year		X			
A002-0100-O1-DATA016	61	Bay Loading			Alarm Power Failed -Dispenser4	1 min	OK/Alarm	1 Year		X			
A002-0100-O1-DATA017	62	Bay Loading			Alarm Power Failed -Dispenser5	1 min	OK/Alarm	1 Year		X			
A002-0100-O1-DATA018	63	Bay Loading			Alarm Power Failed -Dispenser6	1 min	OK/Alarm	1 Year		X			
A002-0100-O1-P001	72	Bay Loading			Pump	5 sec	on/off	1 Year		X			
A002-0100-O1-P002	73	Bay Loading			Pump	5 sec	on/off	1 Year		X			
A002-0100-O1-P003	74	Bay Loading			Pump	5 sec	on/off	1 Year		X			
A002-0100-O1-P004	75	Bay Loading			Pump	5 sec	on/off	1 Year		X			
A002-0100-O1-P005	76	Bay Loading			Pump	5 sec	on/off	1 Year		X			
A002-0100-O1-P006	77	Bay Loading			Pump	5 sec	on/off	1 Year		X			
A002-0100-O1-A0019	78	Bay Loading			RFID Card Reader at DIESEL Bay Loading 2	5 sec	-	1 Year		X			
A002-0100-O1-A0019	79	Bay Loading			RFID Card Reader at DIESEL Bay Loading 3	5 sec	-	1 Year		X			
A002-0100-O1-A0020	80	Bay Loading			RFID Card Reader at DIESEL Bay Loading 4	5 sec	-	1 Year		X			
A002-0100-O1-A0021	81	Bay Loading			RFID Card Reader at GASOHOL95 Bay Loading 1	5 sec	-	1 Year		X			
A002-0100-O1-PT001	82	Bay Loading			Pressure Transmitter	5 sec	kPa	1 Year		X			
A002-0100-O1-PT002	83	Bay Loading			Pressure Transmitter	5 sec	kPa	1 Year		X			
A002-0100-O1-PT003	84	Bay Loading			Pressure Transmitter	5 sec	kPa	1 Year		X			
A002-0100-O1-PT004	85	Bay Loading			Pressure Transmitter	5 sec	kPa	1 Year		X			
A002-0100-O1-PT005	86	Bay Loading			Pressure Transmitter	5 sec	kPa	1 Year		X			
A002-0100-O1-PT006	87	Bay Loading			Pressure Transmitter	5 sec	kPa	1 Year		X			

**Thank you for  
your attention**