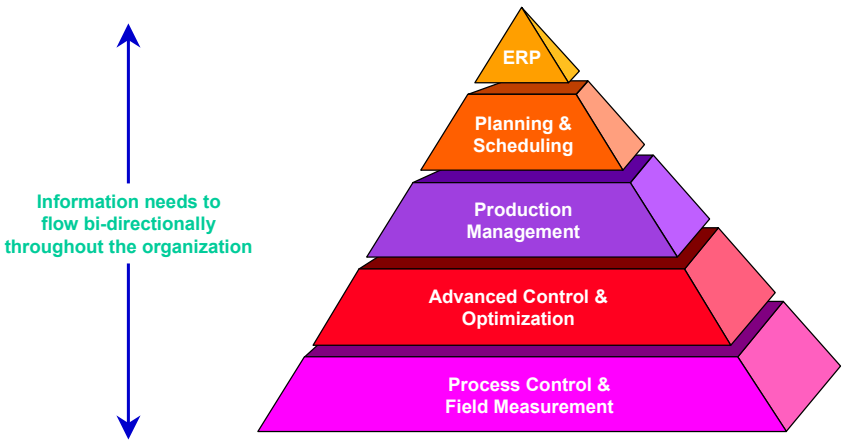
SK㈜ 생산관리 Package 구축사례

최 성 진

Business Process Layer

- **Often, "islands of information" exist or there are frequent discontinuities in the flow, due to multiple operating systems, database and interfaces, making efficient operation difficult to achieve**



What is Operation Information System (OIS) ?

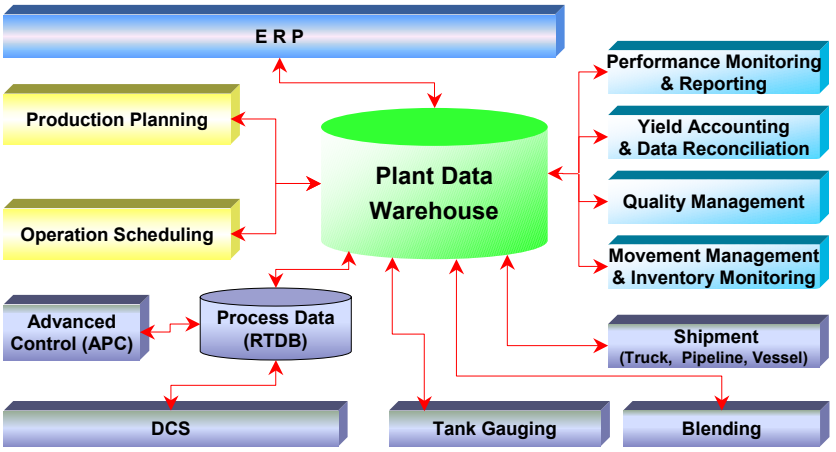
- **OIS is an integrated platform of computers, networks and applications that seamlessly link the control system layer with the business system layer to support improved decision-making for manufacturing operation**
- **OIS enables directly the business cycle of planning, measuring, analyzing, correcting and then planning again.**

Objectives

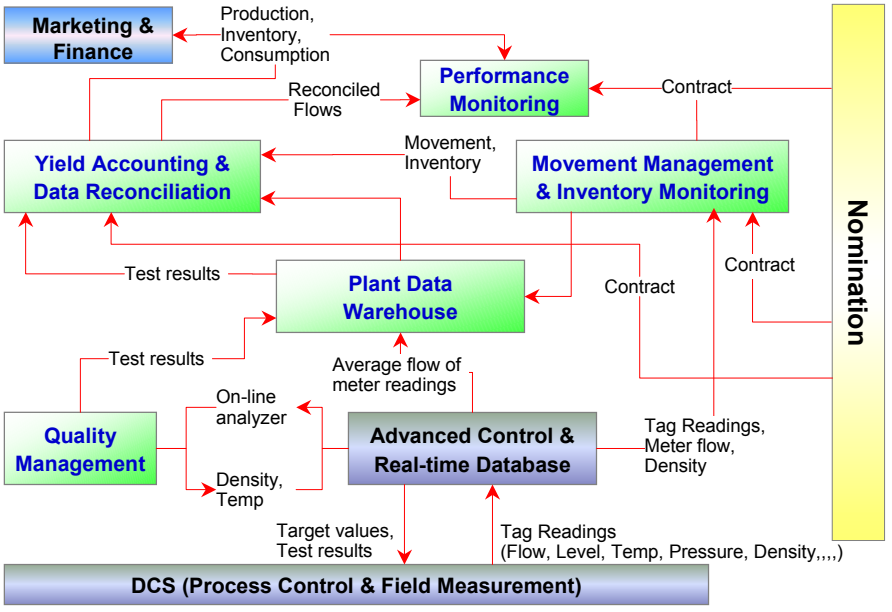
- **To increase speed of business process**
  - ✓ Integrate all processes related to production management
  - ✓ Standardize business process and report
  - ✓ Support ERP as middle layer between control and business domains
- **To report what happened**
  - ✓ Calculate and validate plant production, utility consumption and inventory on day and month to date
  - ✓ Report to management, financial systems, and others
- **To minimize uncertainty when making decisions**
  - ✓ Provide the accurate yield vector and consumption rate
  - ✓ Improve accuracy of planning and scheduling
- **To identify real and accounting losses**
  - ✓ Identify and distinguish real losses from both measurement and movement errors
  - ✓ Recommend corrective actions such as meter calibration and missing flow
- **To track operating performance such as target, plan and actual**

Overview

❑ **OIS fills the important gap between process control and head office business systems with both hardware and applications that support the day to day operations**



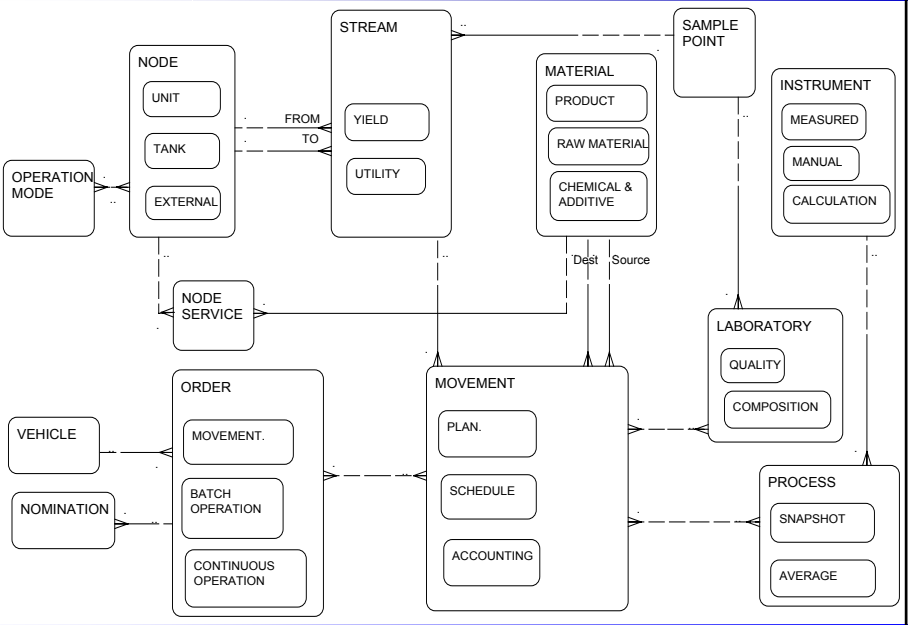
Applications



Functionalities

- Industry-recognized field proven data warehouse for refinery, petrochemical and chemicals
- Assemble application embedded business process of production management
- Data Reconciliation(DR) is a mathematical technique for assisting with both yield accounting and utility consumption problems
- Integrated with Real Time System (RTS), Laboratory Information System (LIMS), Shipment System (DCS/PLC) and Tank Gauging System (TGS)
- Support off-the shelf planning and scheduling system
- Linked to Enterprise Resource Planning system (ERP)

High Level ERD



Functionalities

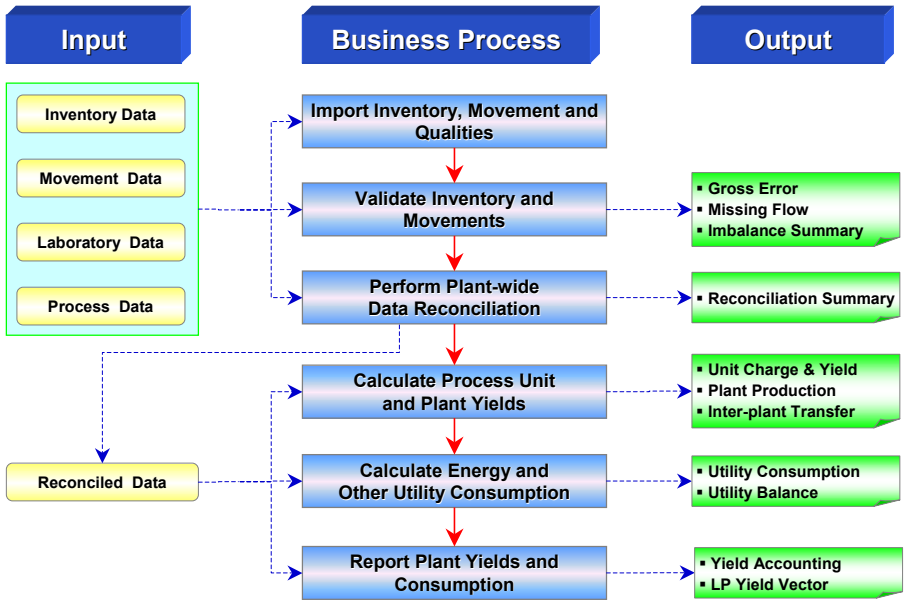
- **Plant Databook**
  - ✓ Resources such as unit, tank, line and measurement
  - ✓ Product and specification
  - ✓ Application specific data
- **Plant Builder**
  - ✓ Define stream such as source and destination
  - ✓ Define stream relationship and constraints
  - ✓ Define measurements and tolerance
  - ✓ Define sample point
- **Plant Historian**
  - ✓ Continuous, periodic and batch data
  - ✓ Planning and scheduling data
  - ✓ Block Data
  - ✓ Movements
  - ✓ Qualities and compositions

Functionalities

- **Calculation Engine**
  - ✓ Process calculation such as static and dynamic
  - ✓ Flow compensation
  - ✓ Tank volume calculation such as gross and net volume
  - ✓ Movement calculation
  - ✓ Composition and qualities tracking
  - ✓ Unmeasured movement flow calculation
- **Standard Gateway for Integration**
  - ✓ Receive process average data from process historian system (RTS)
  - ✓ Receive analytical data from laboratory information system (LIMS)
  - ✓ Receive level data from tank gauging system (TGS)
  - ✓ Receive receipt/shipment data from shipment system
  - ✓ Provide direct query for other applications
  - ✓ Receive/Send nomination and accounting from/to ERP

Business Process

Overview
OIS Architecture
Plant Data Warehouse
Yield Account & Data Rec.
Movement Management
Performance Monitoring
Quality Management
User Interface
Security Management
Benefits



Functionalities

Overview
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Yield Account & Data Rec.
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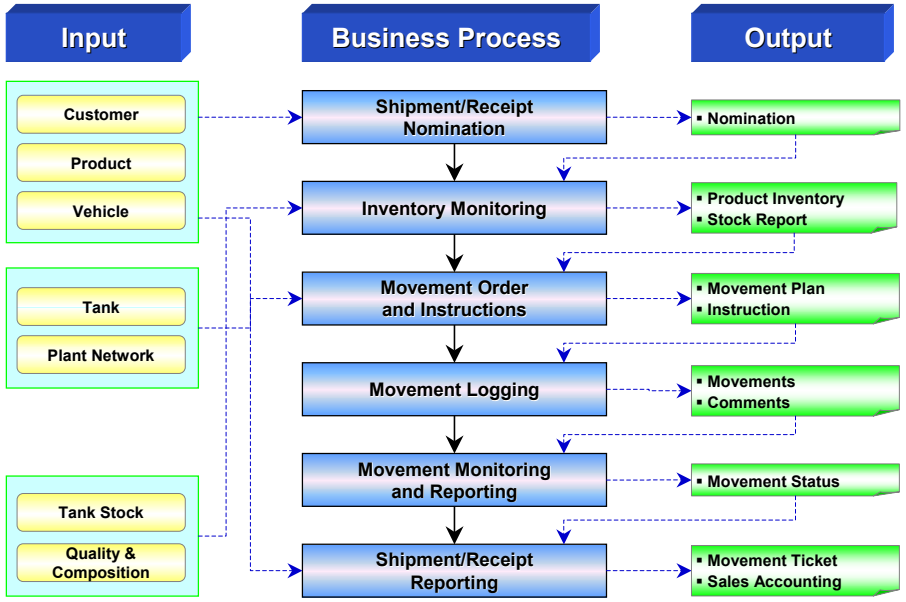
Performance Monitoring
Quality Management
User Interface
Security Management
Benefits

- **Import Inventory, Movement and Qualities**
  - ✓ Provide automatic query to plant historian
- **Validate Inventory and Movements**
  - ✓ View movement exceptions
  - ✓ Provide node imbalances summary
- **Perform plant-wide data reconciliation(DR)**
  - ✓ Highlight gross error and/or missing flow
  - ✓ Provide measured/reconciled node summary
  - ✓ Run DR based on mass and/or volume balance
  - ✓ Run DR based on batch or block balance
- **Calculate Process Unit and Plant Yields**
  - ✓ Provide yield report based on day and month to date
  - ✓ Provide yield vector of process unit for planning and scheduling

Functionalities

- **Calculate Energy and Other Utility Consumption**
  - ✓ Provide consumption report based on day and month to date
- **Report Plant Yields and Consumption**
  - ✓ Provide accounting data to ERP or financial system
- **Compensate closing inventory for on-going movement and unreleased tickets**

Business Process



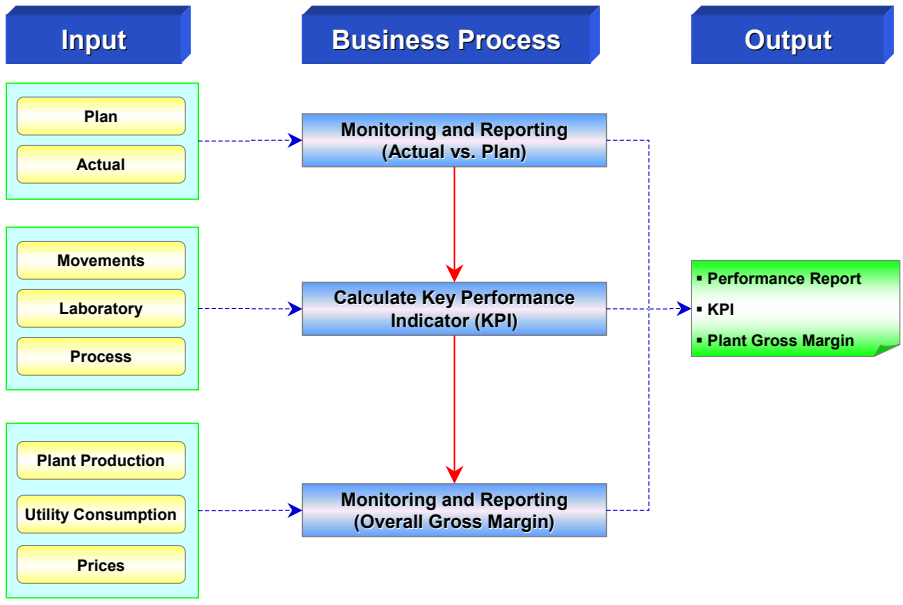
Functionalities

- **Shipment/Receipt Nomination**
  - ✓ Nominate Shipment/Receipt from customer
- **Inventory Monitoring**
  - ✓ Provide the stock level, volume and qualities of tank
- **Movement Order and Instructions**
  - ✓ Define resources such as tank, measurement
  - ✓ Assist the execution of oil movement
  - ✓ Comment on movement instructions
- **Movement Logging**
  - ✓ Entry of flow movement such as receipt, charge, yield, transfer, blend, shipment and consumption
  - ✓ Entry of laboratory data
  - ✓ Entry of tank gauges

Functionalities

- **Movement Monitoring and Reporting**
  - ✓ Tracks the state of movement from nomination to reporting
  - ✓ View actual progress against schedule
- **Shipment/Receipt Reporting**
  - ✓ Provide ticket to ERP or sales system

Business Process



Functionalities

- **Monitoring and Reporting comparing actual data to plan**
  - ✓ Provide automatic query to plant historian
  - ✓ Provide manual entry for targets
  - ✓ Report actual data vs. plan
- **Calculate KPI**
  - ✓ Support user defined calculations using plant historian on demand and/or periodically
- **Monitoring and Reporting Overall Gross Margin**
  - ✓ Provide gross margin based on day and month to date for each plant

Functionalities

- **On-Line Analyzer Monitoring**
  - ✓ Track the deviation between LAB and on-line analyzer
- **Quality Simulation & Management**
  - ✓ Track the density of tank
- **Composition Simulation & Management**
  - ✓ Calculate the composition of crude tank
- **Quality Logging**
- **Sample Scheduling (Supported by LIMS)**
- **Product Certification (Supported by LIMS)**

Overview

- **Driven by business process**
- **Single view oriented navigation**
- **Graphical User Interface using Microsoft Visual Basic (To Be changed Web-Based Interface at 2004.2Q)**
- **Support ODBC compliant for end user applications**
- **Support graphical presentation(Flow diagram)**
- **Keep the last query each application**

Overview

- **Security assignment is made to**
  - ✓ **Individual user ID**
  - ✓ **Each Application**
- **Three levels of security**
  - ✓ View
  - ✓ Information entry authorization
  - ✓ System administrator(Plant model configuration)
- **Maintain revision history**

Benefits

- **Run production accounting on daily base**
  - ✓ Yield, Steam, Electricity, Water, Air, N2, etc
- **Standardize production management business process & report**
  - ✓ Yield Accounting, Utility Consumption, Oil Movement, Inventory
- **Integrate production management business process**
- **Automate yield accounting process from data capturing to accounting**
- **Improve planning accuracy through P-D-C-A cycle**
- **Improve flow meter accuracy**
- **Maintain information consistency**