BOROUGE

Birth of Integrated Petrochemicals Complex - Role of IT integration from Plant to Business System

Optimizing the Chemical Value Chain

Executive Seminar for the Chemicals Industry

The Chateau du Lac, Genval

26th February 2002

A New Force Setting New Standards

Our Name

Borouge means a constellation of stars or towers in Arabic

It symbolizes an organization which is both stable and impressive, rising above its surroundings with ease

Our Business

Borouge is a powerful new force in polymers used in technically demanding applications for flexible and rigid packaging and industrial piping

Who We Are

- A multicultural company built on mutual trust, that integrates technology in its business, with respect for people and the environment

Our vision is to become

- A dynamic, top-performing petrochemical company pioneering new applications to improve the quality of life

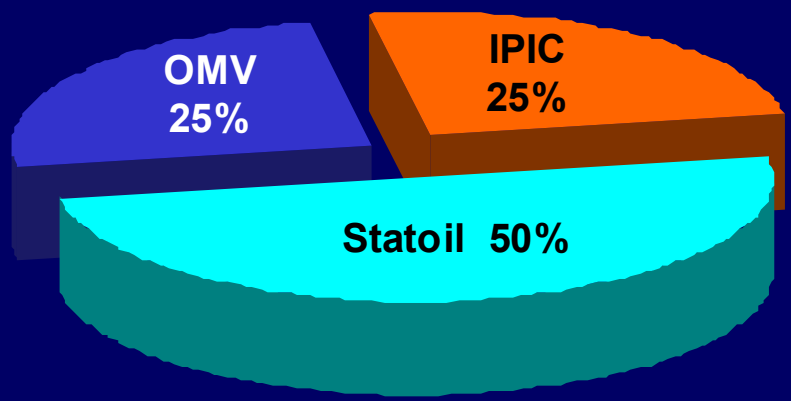
Our Owners

Abu Dhabi National Oil Company- An Established Global Player

- Established in 1971
- Activities are coordinated by The Supreme Petroleum Council
- Continuous growth in all core activities, including petrochemicals
- Financial strength

Borealis – A World Leader in Polyolefin

- Europe's leading polyolefin company
- Strong focus on customers and markets
- State-of-the-art Borstar technology
- Innovative product offering
- Ownership:
  50% by Statoil,
  25% by IPIC, and 25% by OMV



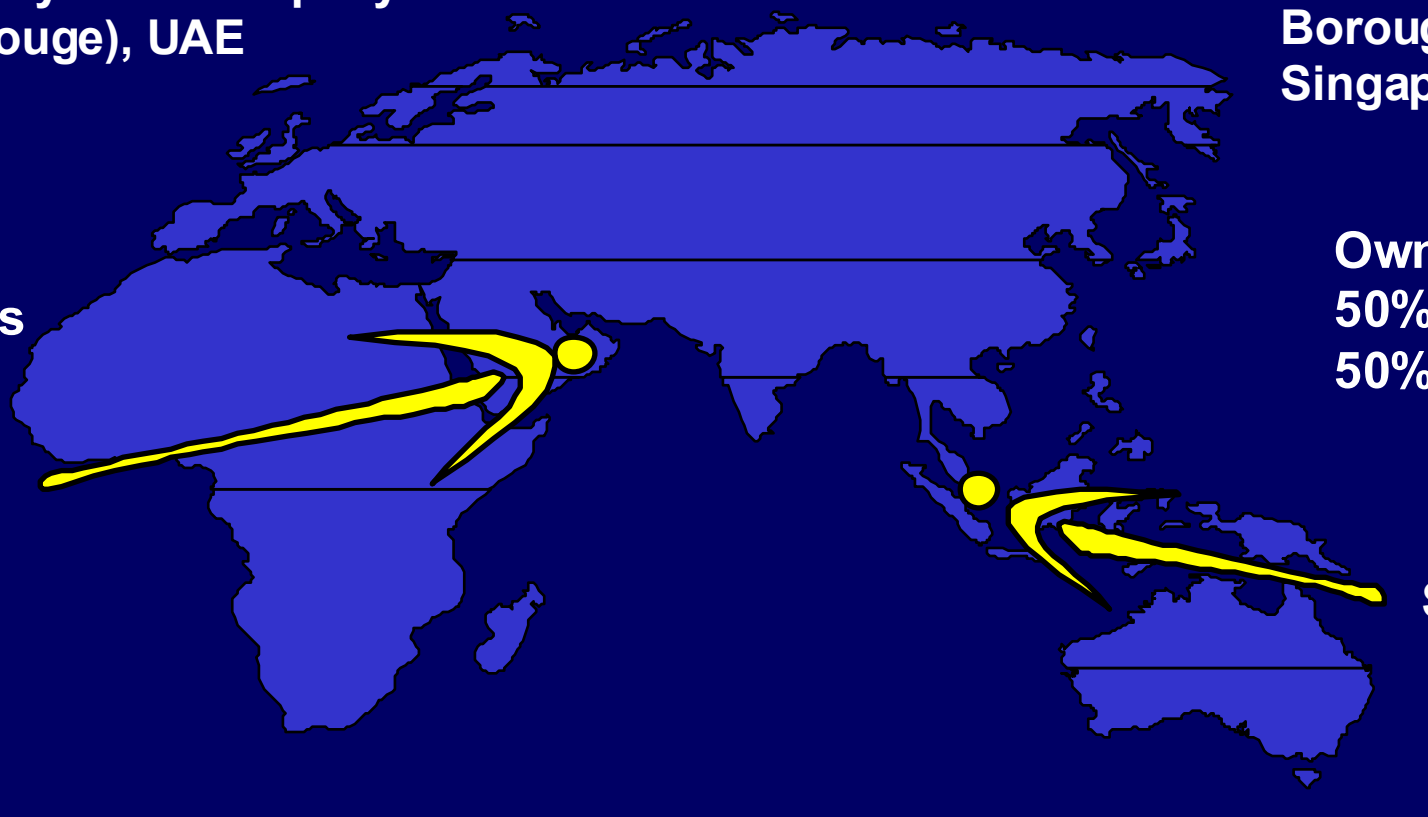
The Companies

PRODUCTION

Abu Dhabi Polymers Company Limited (Borouge), UAE

Ownership:
60% Adnoc
40% Borealis

Abu Dhabi



MARKETING

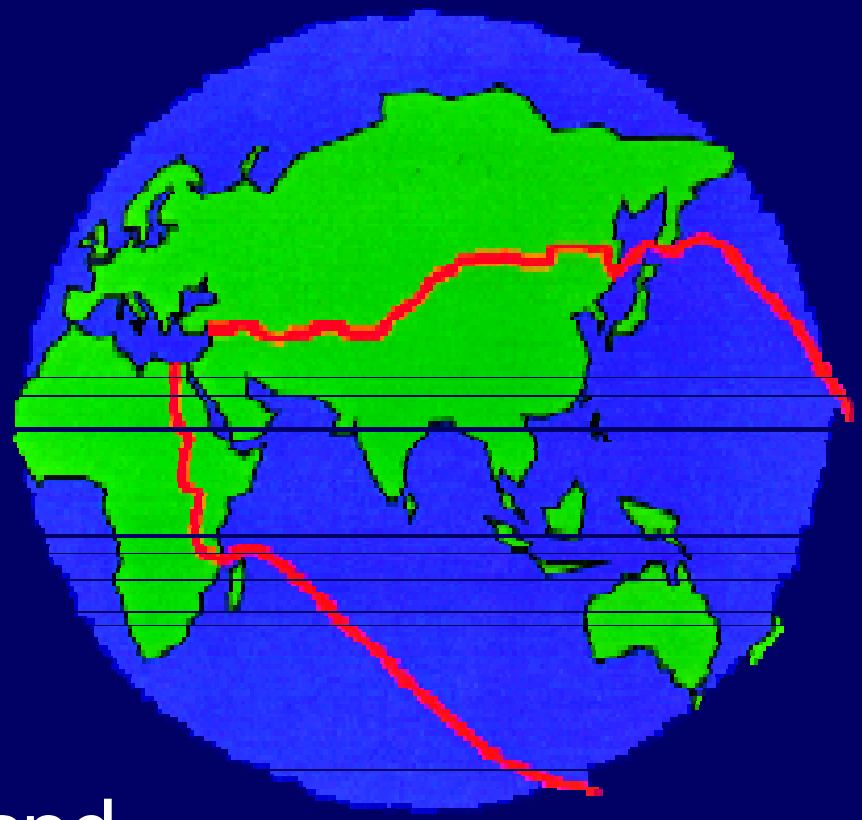
Borouge Pte Ltd, Singapore

Ownership:
50% Adnoc
50% Borealis

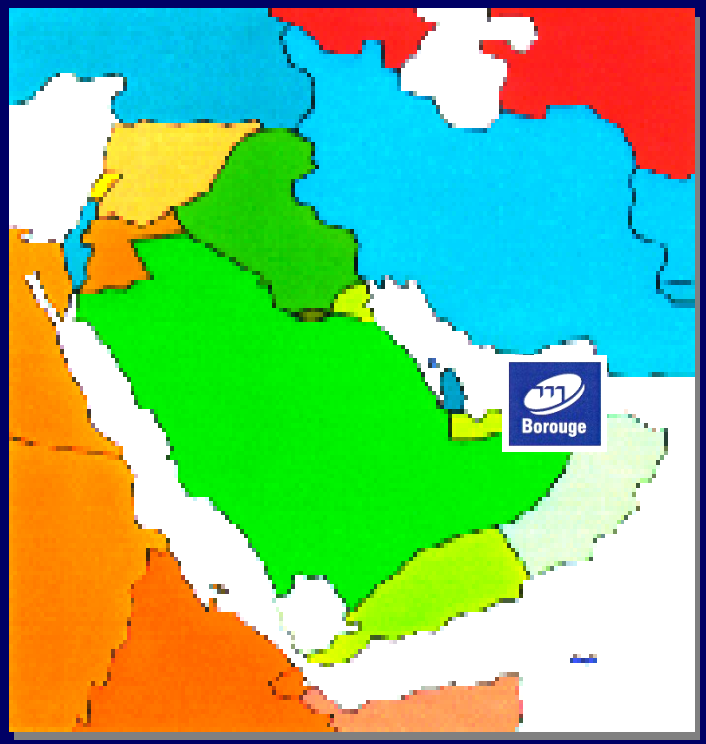
Singapore

The Markets We Serve

- Middle East
- East Africa
- Indian Subcontinent
- North East Asia
- South East Asia
- Australia and New Zealand



Borouge Abu Dhabi - The Production Company



- Production facility: World class petrochemicals complex in Ruwais, 250km west of Abu Dhabi city

Key Features

- Ethane-based cracker: 600,000 tonnes
- 2 Polyethylene plants: 225,000 tonnes each & incorporating Borstar, Borealis' state of the art proprietary technology
- Output: high-density and linear low-density polyethylene
- Start-up December 2001
- Total investments in excess of US$1billion
- 500 employees

What Sets Us Apart

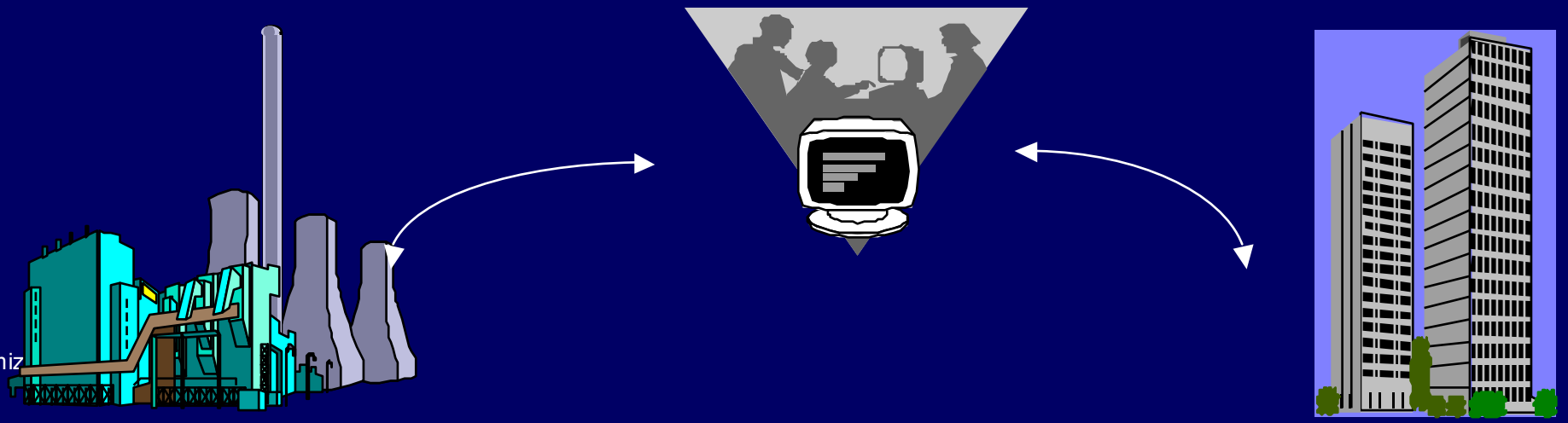
- Borstar technology
- Effective utilization of IT technology
- Fully integrated on time IT system between marketing and production
- Novel solutions in shipping and distribution
- Cost-effective operations that are market and customer driven

Two Legal Companies
One operation

*Totally integration from production in Ruwais to the customers

* SAP chosen to support the total integrated concept and the common operational window of 3 days and 4 hours per day

* High automation in the plants supported by the Manufacturing Execution system (MES)



Optimiz

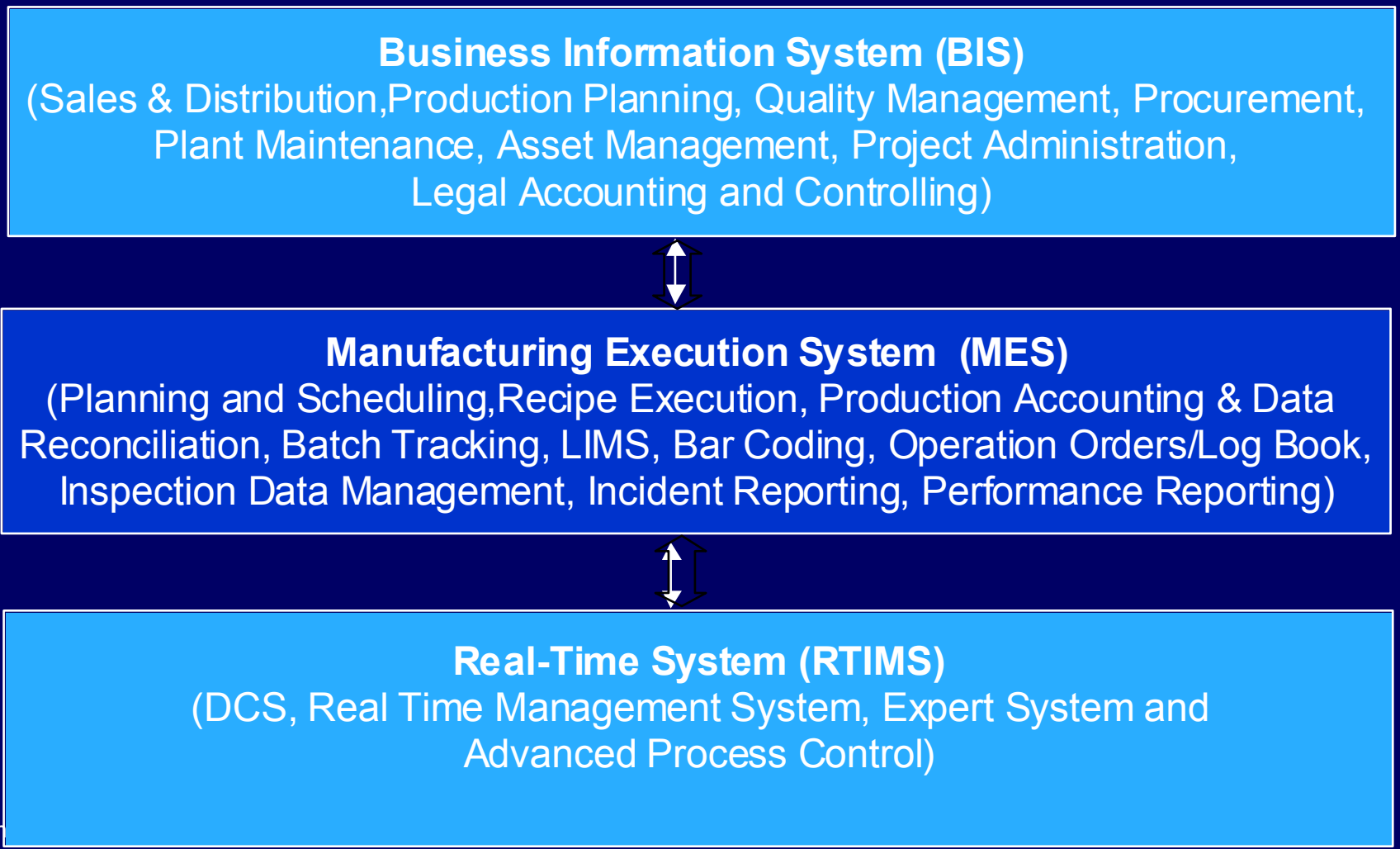
Access to Accurate and Timely Information is a Key Requirement

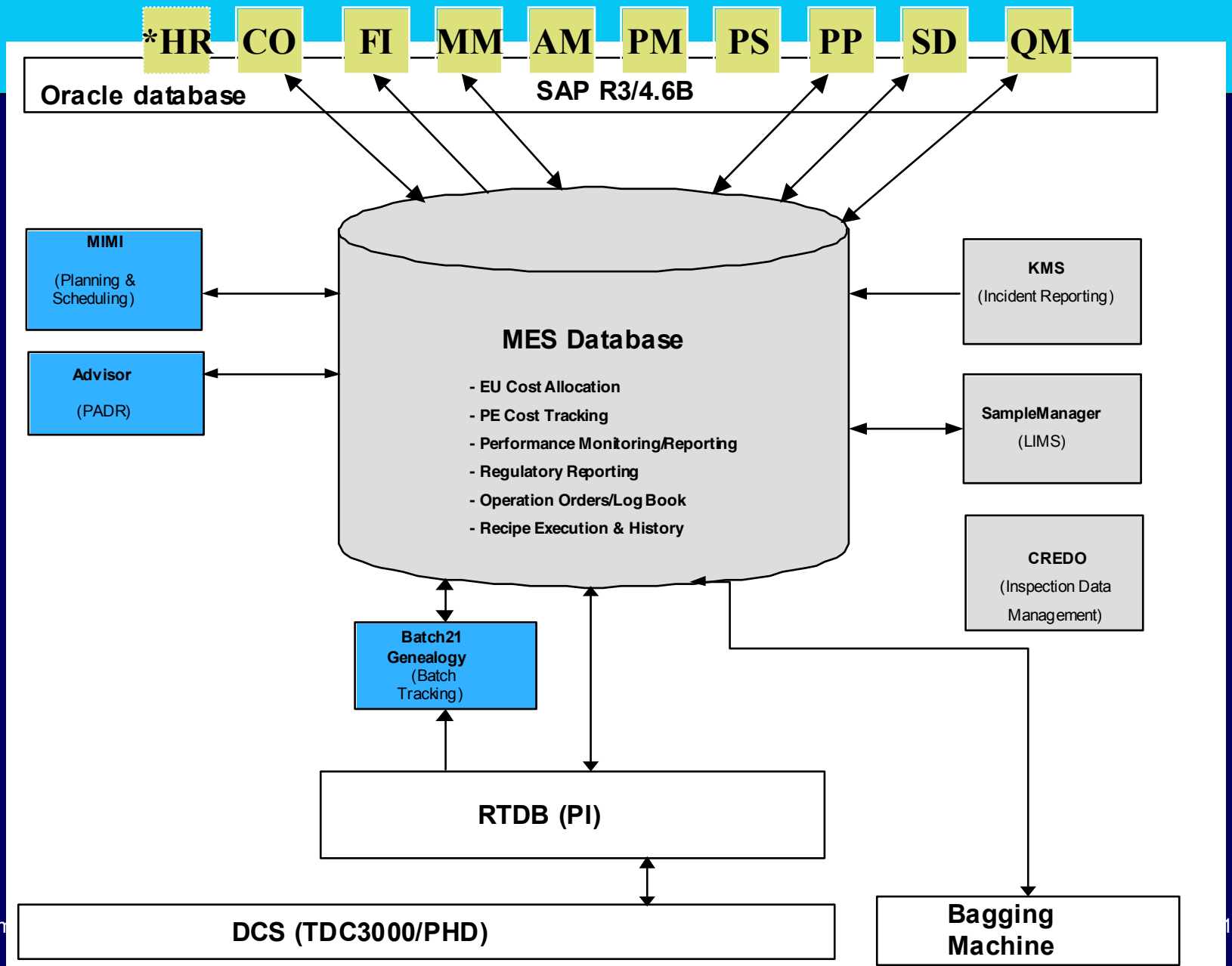
- In order to run a business in the highly competitive petrochemical industry
- In order to operate the highly automated/data integrated ethylene and polyethylene plant - both from a quality and safety point of view
- In order to support ISO certification and issue environmental reports required by the government

Based on the Business Model and the Company set-up

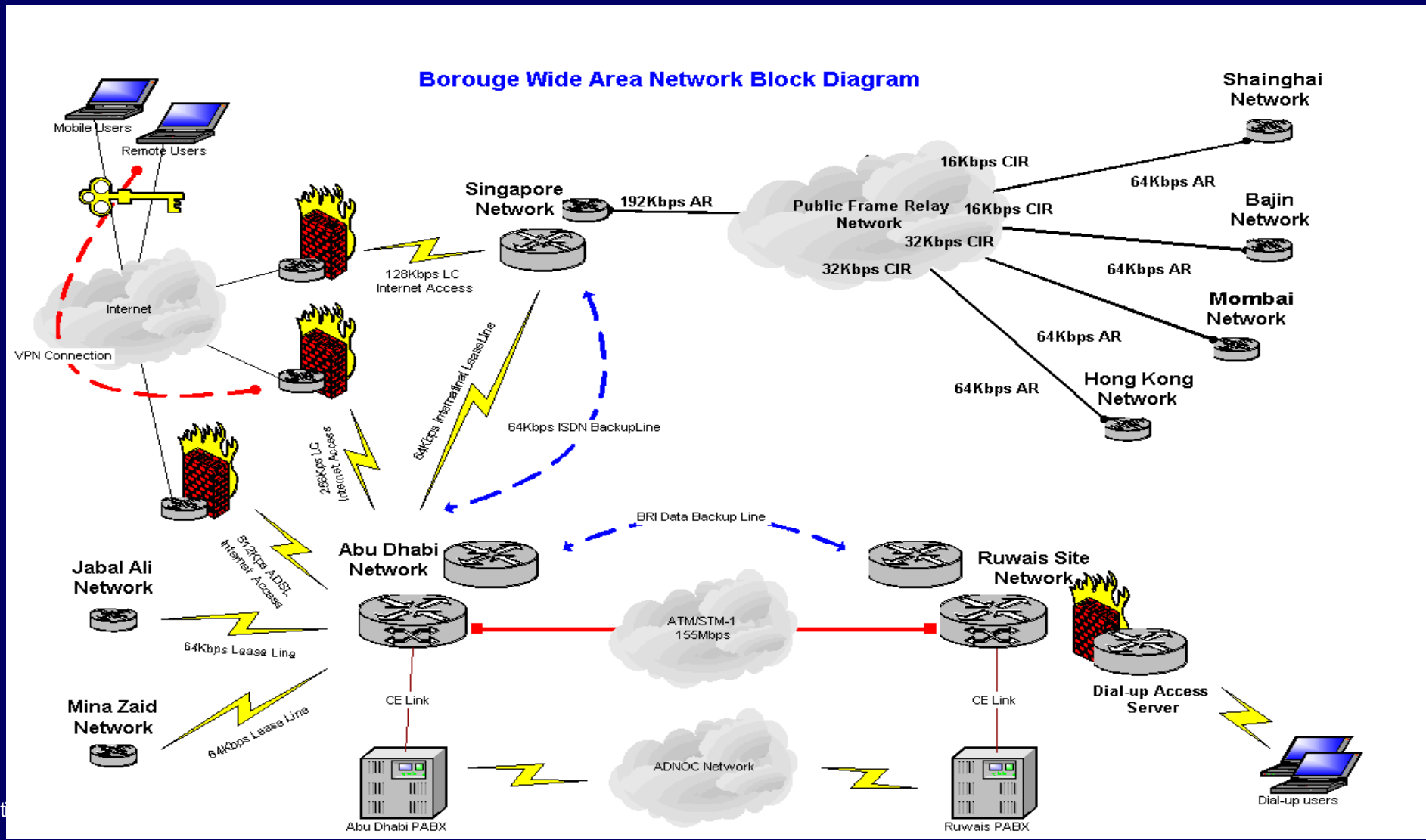
- Two projects were established to develop and implement the system support:
  - Business Information System (BIS) Project
  - Manufacturing Execution System (MES) Project

Borouge Integrated Systems




*HR
CO
FI
MM
AM
PM
PS
PP
SD
QM
Oracle database
SAP R3/4.6B
MIMI
(Planning & Scheduling)
Advisor
(PADR)
MES Database
- EU Cost Allocation
- PE Cost Tracking
- Performance Monitoring/Reporting
- Regulatory Reporting
- Operation Orders/Log Book
- Recipe Execution & History
KMS
(Incident Reporting)
SampleManager
(LIMS)
CREDO
(Inspection Data Management)
Batch21 Genealogy
(Batch Tracking)
RTDB (PI)
DCS (TDC3000/PHD)
Bagging Machine

Wide Area Network Model



Production, Distribution & Sales are The Core Activities for Borouge

- The functional processes supporting the business
- The systems supporting the processes

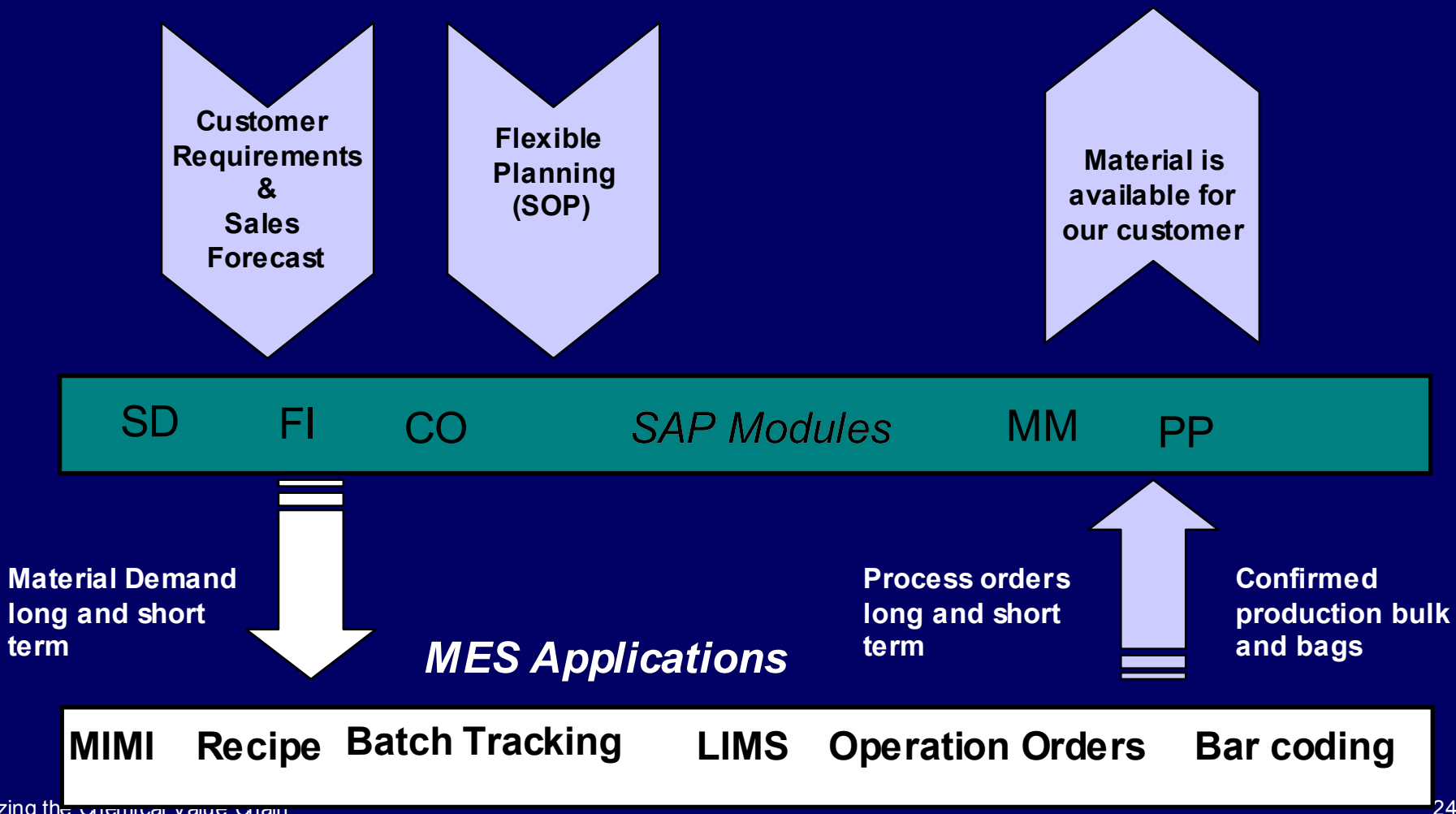
The Demand Process

- The Sales Manager will prepare a sales forecast
- The Planner will review the demand and prepare plan and schedule orders
- The Operator in Ruwais will get the scheduled orders and start production

The Supply Process

- The Planner will prepare a long term plan for the total Ruwais complex and short term orders for PE production
- The Operator in Ruwais will confirm the PE orders and make the material available for delivery to the customer
- The QA in Ruwais will test and classify the material

System Support for PE Demand and Supply



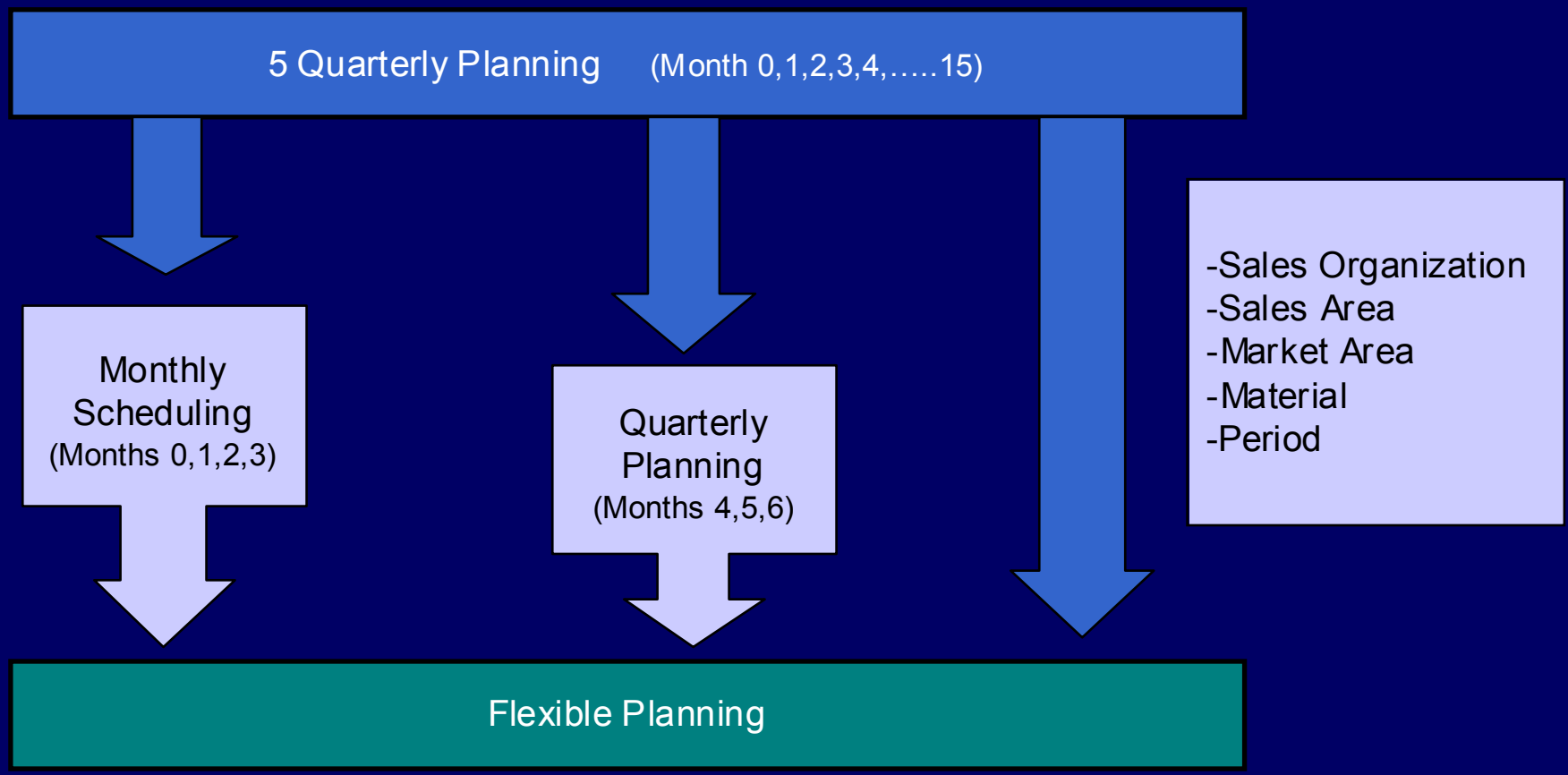
Sales Planning in SAP

- Sales Planning is done in the SD module in SAP and has 3 horizons and is broken down on Sales Organization, Sales Area, Market Area, Material and Period/Year, Quantity.

Sales Planning – 3 Horizons

- 5 Quarter plan is done twice a year for the next 5 quarters
- Quarterly plan is done once per quarter for the next quarter (M4, M5, M6)
- Monthly plan is done every month for the current month and the next 3 months (M0, M1, M2, M3)

Sales Planning in SAP



Flexible Planning in SAP

- Flexible Planning is the stage in SAP where the planner is preparing the plan for transfer to MES

- Flexible planning has the following plan hierarchy:
  - Plant
  - Product Family (film, molding, ….)
  - Material group (10128 -the material number in SAP)
  - Material code (bulk ,bag)
  - Period (month)
  - Quantity

PE Demand from SAP to MES

-Plant
-Product Family (film, pipe)
-Material group
-Material code
-Quantity

Flexible Planning Demand
PP

Sales orders
SD

Replenishments for TSC*)
PP

Inventory of materials
MM

MIMI in MES

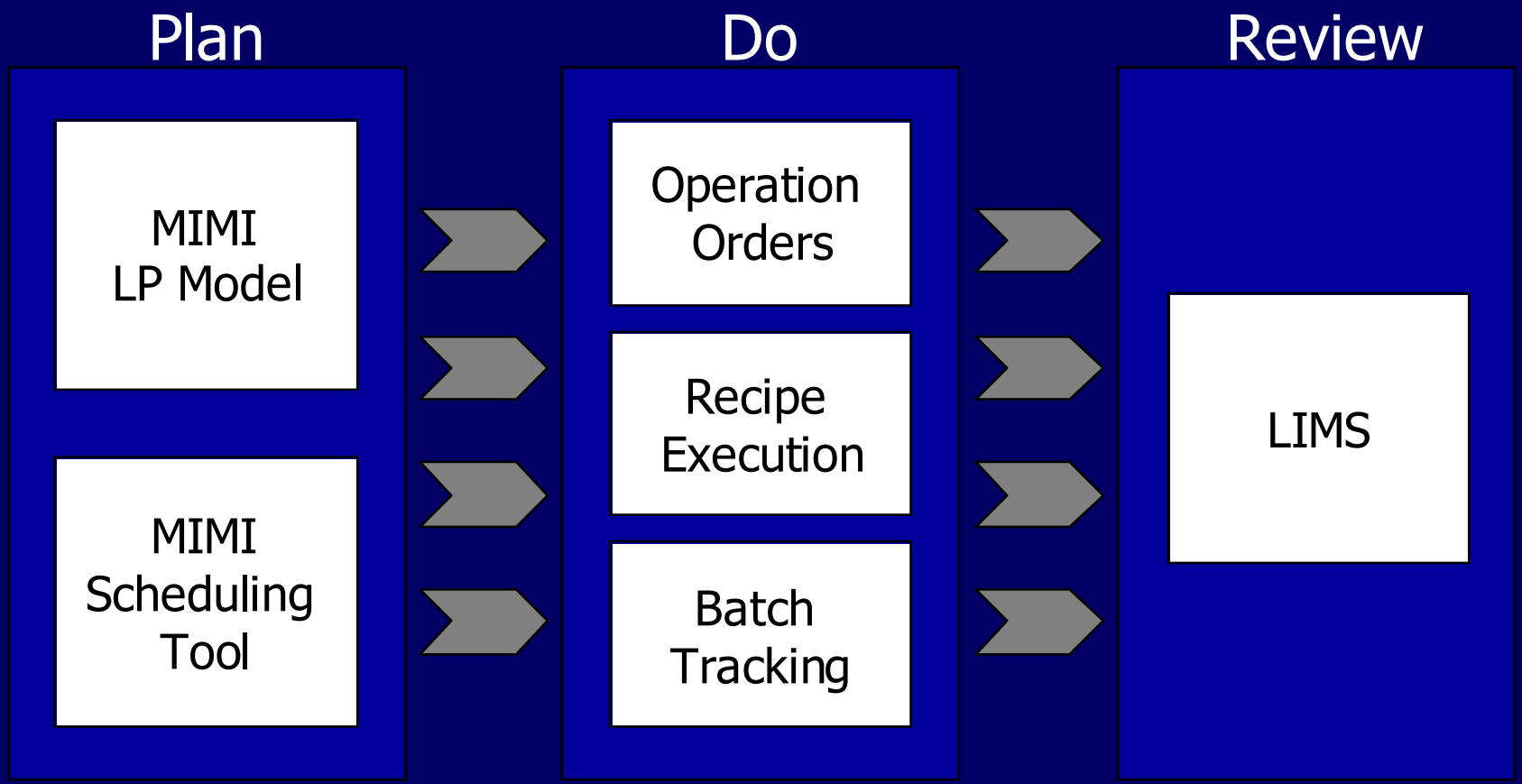
MES considerations:
-Monomer availability
-Minimum production runs
-Production cycles including transitions
-Recipes
-Lead-time
-Capacities
-Resources

*) TSC = Transshipment Center

MIMI – Supply Planning

- MIMI has 2 planning features, the long term - LP model and the short term - scheduled orders
- The LP model will be used to plan the cracker, the Butane 1, the PE lines and product handling area
- The schedule orders will be used for short term production and packing planning

MES Applications Supporting Demand and Supply



Supply Activities in Ruwais

- The operator will get the process order and start to prepare production
- The panel operator will activate the recipe execution and start production
- The operator will bring catalyst and additives for input to production

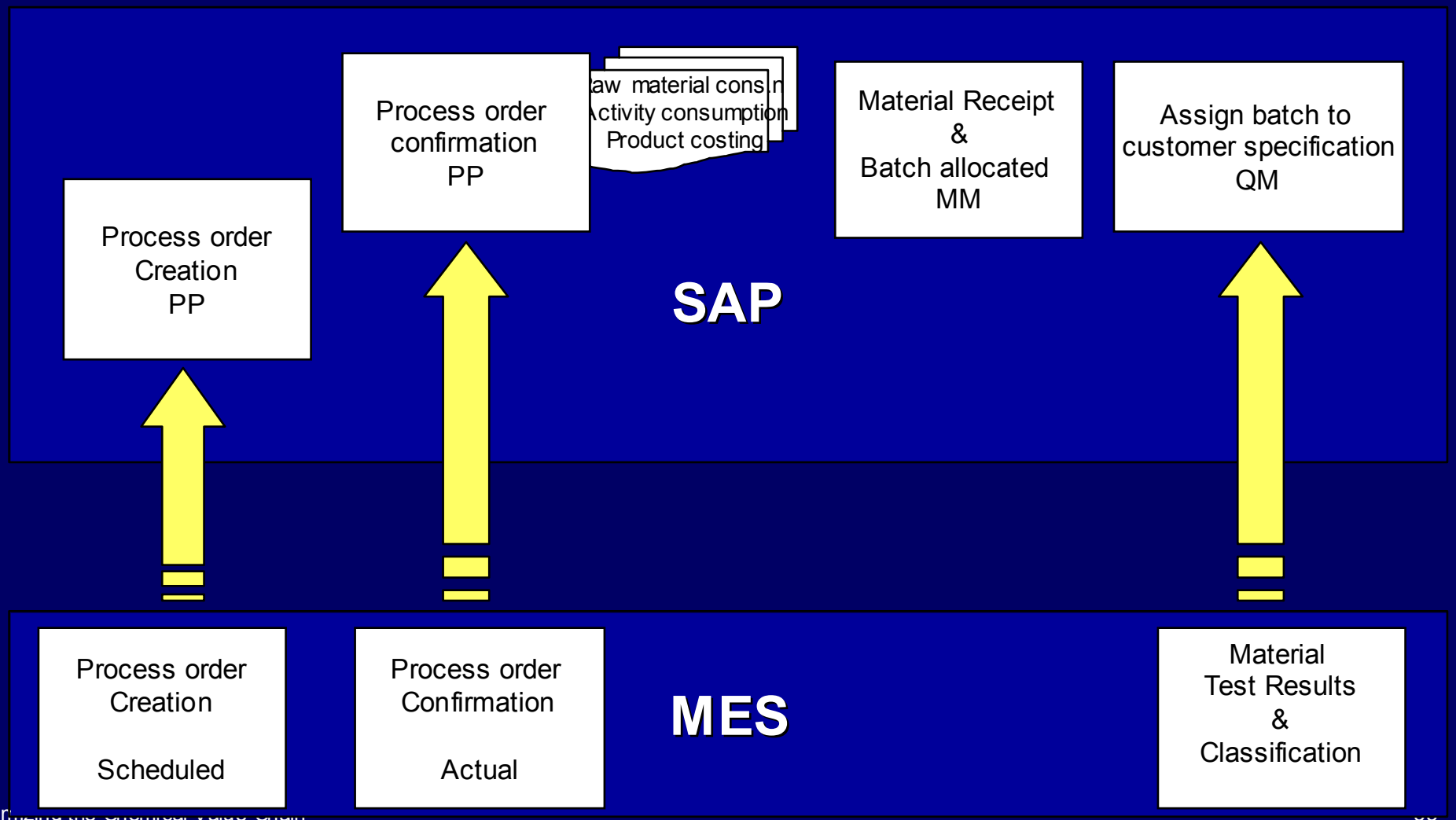
System Support in Ruwais

- Bar Code application will record catalyst and additive material identification
- Batch Tracking application will capture data for tracking production events
- DCS will capture data for transfer to RTIMS and MES

The PE Supply Process

- The batch will be born in the blender
- A sample will be sent to lab for testing
- Classification will execute confirmation of the batch and the shift supervisor will make the material available for delivery to the customer
- Information will be sent to SAP and planned availability will be actualized

Data Transfer from MES to SAP



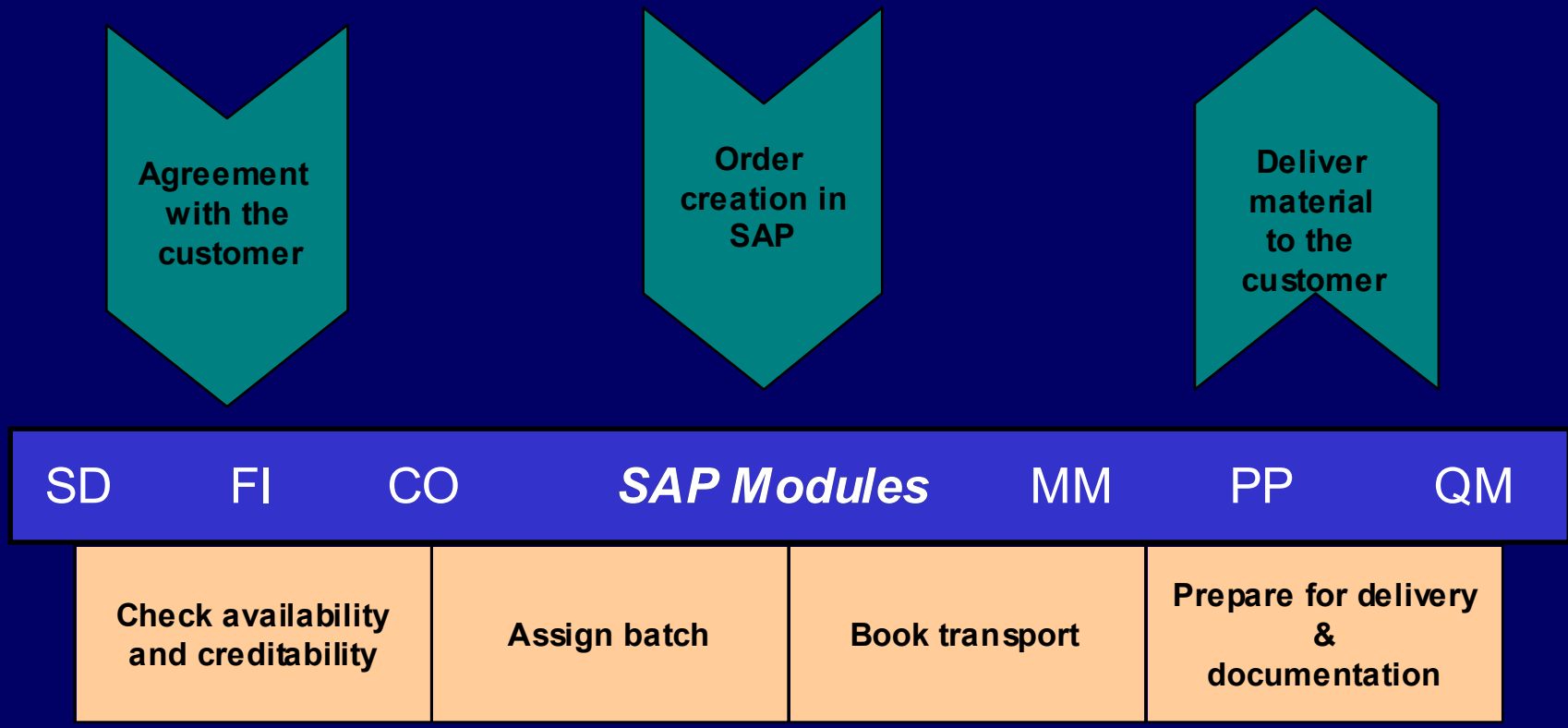
The Order Handling Process

- The Sales Manager will make an agreement with the customer and create a sales order
- The order handler will check:
  - Material availability
  - Customer credibility

The Order Handling Process

- Assign batch to the order based on customer specification
- Book transport
- Prepare documentation for delivery to the customer
- Certificate of Analysis will be executed in SAP

System Support for Order Handling



Current Situation: 2 months after plant start up and 1 year after marketing company start up

- 100% End user ratio
- 100% Internet browsing facility ratio
- 100% E-mail facility ratio
- 10% Remote Access facility ratio

IT&A Cost Efficiency

- 43 total IT&A staff covering BIS and MES in addition to IS, Telecommunication, Process Automation/Engineering
- IT Investment is 3% of Total Investment
- IT Operational budget for 2002 is 5% of Total Operational Budget