



**LUKOIL**  
OIL COMPANY

**Implementation of Oracle  
Enterprise Asset Management,  
Contracts & Integration with  
SAP at Dubai and Iraq**

**Evosys SME Team**

# Agenda

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  - **Fact**
  - **Business Need**
  - **Challenges**
- **Solution Contents**
- **Our Scope**
- **Asset Model**
- **Maintenance Strategies**
- **Work Management**
- **Maintenance Material Planning**
- **Integration Points with SAP**
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  - **Materials Synchronization**
  - **Material Planning**
  - **Employees Database**
- **Business Benefits**
  - **Oracle EAM benefits**
  - **Synergies from Integration**

# About Lukoil



- 2.1% of global production of crude oil
- The largest privately owned oil & gas company in the world by proved oil reserves
- 2nd largest privately owned oil & gas company in the world by oil production .
- Active in sectors of Exploration, refining and power generation.
- 16.6% of Russian crude oil production and 16.5% of Russian crude oil refining
- The biggest Russian privately owned oil company with \$141 billion revenue and net income in excess of \$7 billion

# Facts



- Client uses SAP for all other operations.
- FMIS ( Asset Management Suite which included Oracle EAM, custom material planning and contract management solution) is now implemented.
- One of the rare stand-alone EAM implementation integrated with SAP
- FMIS is integrated to SAP by SOA webservice.
- There are 2 organizations live now, one for Iraq and another for Dubai.
- System Statistics
  - **18,000+ work orders per annum**
  - **8000+ maintained assets**
  - **2000+ preventative maintenance schedules**

# Business Needs



- As West Qurna 2 is biggest undeveloped oilfields project most of the processes were driven manually a tedious and painful task for Corporate Service Division, Business was looking for the system that would automate and streamline Corporate/Facility services and integrate with its SAP-ERP system.
- A complete Facility Management Information System (FMIS) was configure/developed to automate, streamline and integrate Corporate Service Processes with other information systems of Lukoil.
- FMIS consist of: (i) Helpdesk Module, (ii) Contract Module, (iii) Asset Module, (iv) Canteen Module & (v) Camp Module.



# Challenges

- Involvement of many vendors
- Expertise in Various Technologies
- Integration with SAP and other Information Systems



# Solution & Project Timelines

- **Solution Comprised of following components-**
  - Distributed Oracle eAM (Standalone eAM)
  - Custom Contract Management Tool for Maintenance Contracts
  - Custom Material Planning Tool to plan for Future Material Requirements of Maintenance operations
  - Multiple Integration points with SAP

**Operating System** :Windows 64 bits

**Project Kick Off Date** : 8<sup>th</sup>

December 2013

**Project Go Live Date** : 27<sup>th</sup>

May 2014

# Our Scope

- Lukoil has been awarded an Oil and Gas Concession Contract in Iraq known as West Qurna Field. Camps are procured on an EPC basis.
- Lukoil has global corporate headquarter in Dubai.
- Our implementation was for facilities of whole West Qurna Camp and Dubai Corporate Office



# Asset Model – Asset Numbers

- Asset Numbers are the key entity in eAM
- Mostly represent physical assets
- Can be virtual assets in asset hierarchy for roll-up/grouping
- Assets are setup either as a;
  - Capital Asset or
  - Rebuildable Inventory Components which rotate on/off Capital Assets and are repaired/refurbished in between.
- Asset Numbers exist in separate register (using Oracle Install Base) than the Fixed Asset register
- Asset Numbers in SAP were not used.

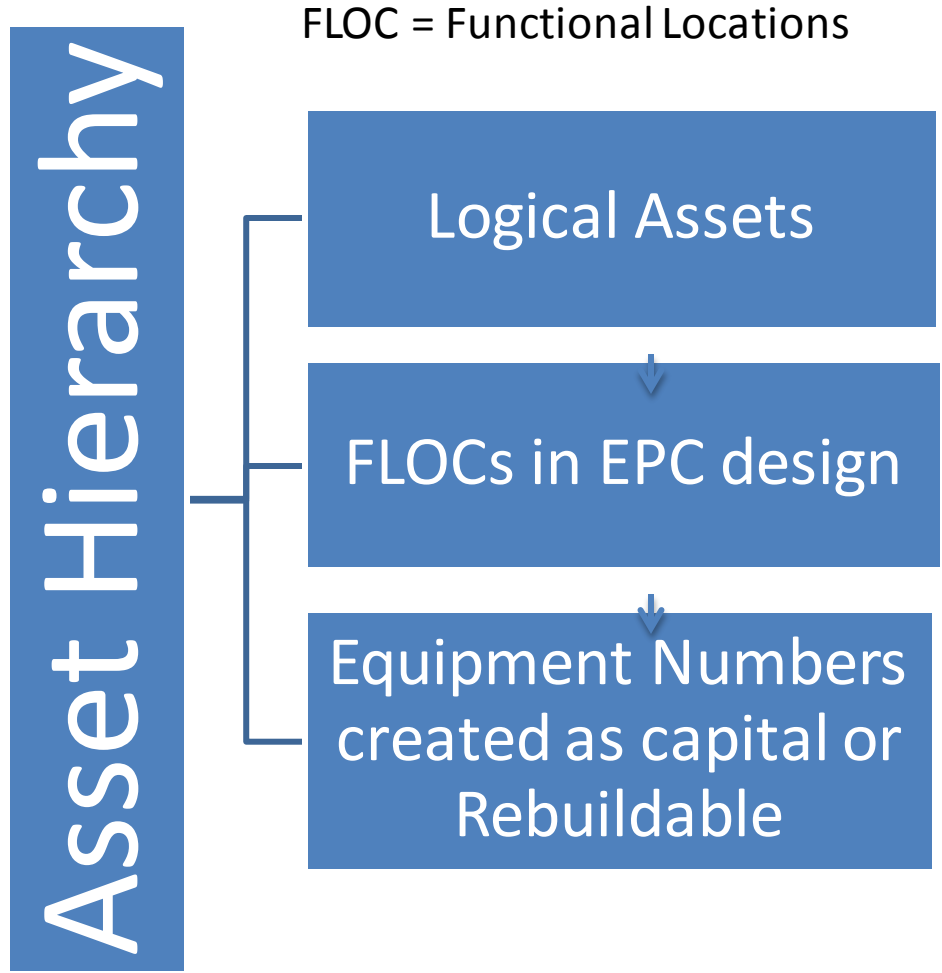
# Asset Model - Asset Groups

- Each Asset belongs to an Asset Group
- Many key configurations driven by Asset Group
  - Asset Bills of Materials – Typical materials used for maintenance
  - Templates – Provides automatic creation of Preventative Maintenance configuration e.g. Activities, Meters, Schedules
  - Asset Attributes – Storage of additional asset information
  - Failure Analysis – Failure, Cause and Resolution
- Define groups to represent virtually identical assets, in terms of materials and preventative maintenance e.g. *Make and Model combination*.

# Asset Model - Asset Hierarchy

- Assets belong in a hierarchy
- Each Asset has a Parent Asset
- Establishes a roll-up mechanism for;
  - Cost reporting
  - Preventative Maintenance forecasting
  - Searches
  - Maintenance and failure history
- Virtual assets at top of hierarchy to deliver meaningful rollups;
  - Production or process affinity
  - Geographical or physical location

# Asset Model - Asset Hierarchy



# Asset Model - Asset Hierarchy



- [-] 0151.51.500 (INFRASTRUCTURE FACILITIES)
  - [-] 0150.81.500.GT
  - [-] 0151.51.550.ACC (MAIN ACCOMODATION CAMP)
    - [+] 0151.50.433 (FIRE AND GAS SYSTEM, ACC)
    - [-] 0151.51.340 (Fire water system, acc)
      - [-] 0151.51.550.00.TK-001 (Fire Water Tank, Accommodation Camp)
        - [-] 0151.51.550.00.MOV-201 (Valve Actuator, Motor oper. Raw Water to FW Tank)
        - [-] 0151.51.550.00.P-001 (Fire Pump (Duty), FW Tank TK-001)
        - [-] 0151.51.550.00.P-002 (Fire Pump (Stand by, Diesel), FW Tank TK-001)
          - [+] 0151.51.550.00.PG-221A (Press Indicator, Inlet, Fire Pump P-002)
          - [+] 0151.51.550.00.PG-221B (Press Indicator, Outlet, Fire Pump P-002)
          - [+] 0151.51.550.00.PSV-221 (PSV, Fire Pump P-002)
          - [+] 0151.51.550.00.STR-004 (Strainer, Fire Pump P-002)
          - [-] 0151.51.550.00.TK-002 (Fuel Oil Tank, Fire Pump P-002)
          - CEDE-GNRL-LARENE-0003 (COMBUSTION ENGINE)
          - EECP-GNRL-LARENE-0021 (PUMP CENTRIFUGAL)
        - [-] 0151.51.550.00.P-003A (Jockey Pump (Duty), FW Tank TK-001)
        - [-] 0151.51.550.00.P-003B (Jockey Pump (Stand by), FW Tank TK-001)

# Maintenance Strategies - Activities

- Activities are predefined Maintenance work to be completed
- Generally routine work e.g. *exchange pump, replace tyres* or preventative maintenance work e.g. *services / inspections*
- Activities define the following
  - Operations (Tasks)– More detailed tasks of the predefined work
  - Bills of Materials – Required materials
  - Routings – Required labour or equipment
  - File attachments – Such as service sheet, diagrams, safety procedures

# Maintenance Strategies

- Strategies were predefined for each kind of maintenance activity for all the category of assets.
- These Strategies were mapped as standard operations and these standard operations were clubbed into activities.
- Standard Operations had their contract references also, for billing of works executed, be it of preventive or corrective maintenance.

# Maintenance Strategies – Execution and Forecasting



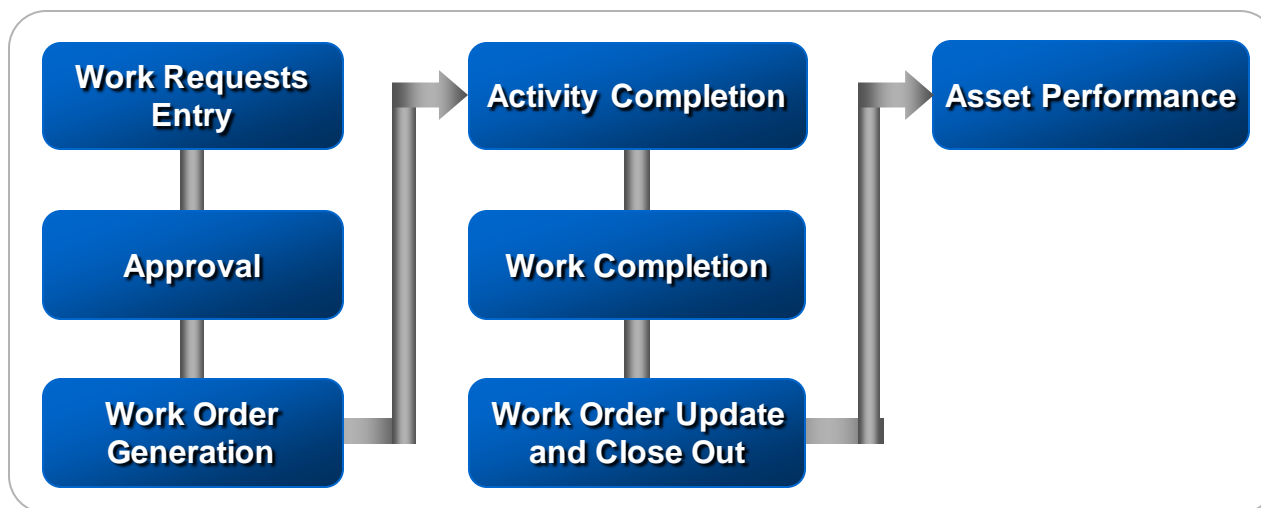
- Custom solution was given to provide calendar view of maintenance activities coming up

Lukoil Forecasted Work Oder Grid			01-Week-2014	26-Week-	27-Week-	28-Week-	29-Week-	30-Week-
HVIN-GE_CT.SAC-0007	0151.22.500.CT.SAC-0007	0151.22.500.CT			ECL-HV-001			
HVIN-GE_FS.SAC-007	0151.22.500.FS.SAC-007	0151.22.500.FS				ECL-HV-001		
HVIN-GE_FS.SAC-008	0151.22.500.FS.SAC-008	0151.22.500.FS				ECL-HV-001		
HVIN-GE_MS.SAC-0009	0151.22.500.MS.SAC-0009	0151.22.500.MS				ECL-HV-001		
HVIN-GE_WS.SAC-0001	0151.22.500.WS.SAC-0001	0151.22.500.WS			ECL-HV-001			
HVIN-GE_WS.SAC-0007	0151.22.500.WS.SAC-0007	0151.22.500.WS			ECL-HV-001			
HVIN-SACI_CT.SACI-0003	0151.22.500.CT.SACI-0003	0151.22.500.CT			ECL-HV-001			
HVIN-SACI_CT.SACI-0014	0151.22.500.CT.SACI-0014	0151.22.500.CT			ECL-HV-001			



# Work Management

- Below is the Seeded Work Management Cycle in Oracle –



Work Requests were interfaced from a separate helpdesk custom application in Lukoil.

# Work Management – Work Orders

- Work Orders represent specific instances of Maintenance work for an asset
- Created in the following ways;
  - Manually i.e. unplanned / corrective work
  - Automatically by Preventative Maintenance forecast
- Work Orders record maintenance history and planned and actual costs
- Work Orders must have;
  - Asset associated
  - One or more Tasks i.e. Operations
  - Scheduled Start / End Time
- Work Orders can have;
  - Predefined Work assigned i.e. Activity
  - Material requirements i.e. Stock, Non Stock, Requisitions
  - Labour requirements i.e. Trade resource

# Work Management – Work Orders

**Work Order (LME)**

Work Order: 6397  
 Asset Number: 0150.50.000.CP.01-SAC-0001  
 Asset Group: HAVE  
 Asset Activity: ECL-HV-001  
 Class: G267100002  
 Status: Complete by Supervisor  
 Pending  
 Parent Work Order:  
 Relationship Type:

Department: INFRA\_HVAC  
 Priority:  
 Work Order Type: Preventive Maintenance  
 Shutdown Type: Not Required  
 Warranty Status:  
 Failure Information:  
 Failure:  
 Cause:  
 Resolution:  
 Material Shortage:  
 Material Shortage: No As Of Date: 06-JUN-2014 13:21:39

Firm  
 Tagout Required  
 Enable Material Issue Re  
 PM Suggested Start Date:  
 PM Suggested End Date:

Operations Materials Resources Relationships

**Operation Information**

Operation Contract Reference: Ecolog preventive  
 Contract Number: 100017084  
 Contract Line Number: 30  
 Service Line Number: 10  
 UOM: Activity Unit  
 Unit / Rate: 30.95  
 Unit: 1  
 PO Number: 4500050907  
 Date of Payment:

OK Cancel Clear Help

Operation	ption	Shutdown Type	Scheduled Start Date	Scheduled Completion Date	Scheduled Dura
10	ditioner inspection		08-JUN-2014 00:00	08-JUN-2014 01:00	1

# Work Management – Work Orders



Update Work Order: 6397

\* Indicates required field  
Time = hours

Work Order **6397**  
 Asset Number **0150.50.000.CP.01-SAC-0001**  
 Asset Group **HAVE**  
 Wip Accounting Class **G267100002**  
 Scheduled Start Date    
(example 02-Sep-2014 10:01:37)  
 Scheduled Completion Date    
 Duration   
 Request Number  Other Request:  
 \* Description

Department    
 Department Description **WQ-HVAC-INFRA**  
 Asset Activity **ECL-HV-001**  
 Firm    
 Status    
 \* Work Order Type    
 Shutdown Type    
 Priority    
 Pending

Work Order Stats	
Required Hours	1
Assigned Hours	0
Unassigned Hours	1
Estimated Cost	
Actual Cost	
Material Shortage	No as of 06-Jun-2014 13:21:39

Additional Details

Failure Information

Operation Requirements

Select Row:

|

Select	Details	Operation	Description	Department	Resource Sequence	Resource	Required	Assigned Units	Employee or Equipment	Start Time	End Time	Duration	Instances Assigned	Assigned Hours	Flex
<input type="radio"/>	<input type="button" value="+ Show"/>	10	Air conditioner	INFRA_HVAC	10	ECLOG_HVAC	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value=""/>	08-Jun-2014 00:00:00	08-Jun-2014 01:00:00	<input type="text" value="1"/>	0		
<input type="radio"/>	<input type="button" value="+ Show"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			<input type="text"/>			

# Work Management – Completion




- Completion updates Last Service information e.g. 250hr service completed at 12,500 hrs on 01-Feb-2010
- Prevents further costs being coded to the Work Order
- Captures the following information;
  - Actual Start and End time
  - Job Notes
  - Failure Analysis
- In Lukoil most of the maintenance is outsourced, so work completion comprises of two steps of contractor's completion and certification by supervisor for the same. Only completed work order is eligible for payment and is sent to SAP

# Maintenance Material Planning

Custom Material Planning solution Integrated with SAP is also provided to accommodate control and planning of materials required in asset maintenance.

## Lukoil Inventory Planning

### Search

\* Date  

ITEM CODE

\* Difference QTY<

\* INV ORG

ITEM TYPE

\* Purchase Group

### Search Result

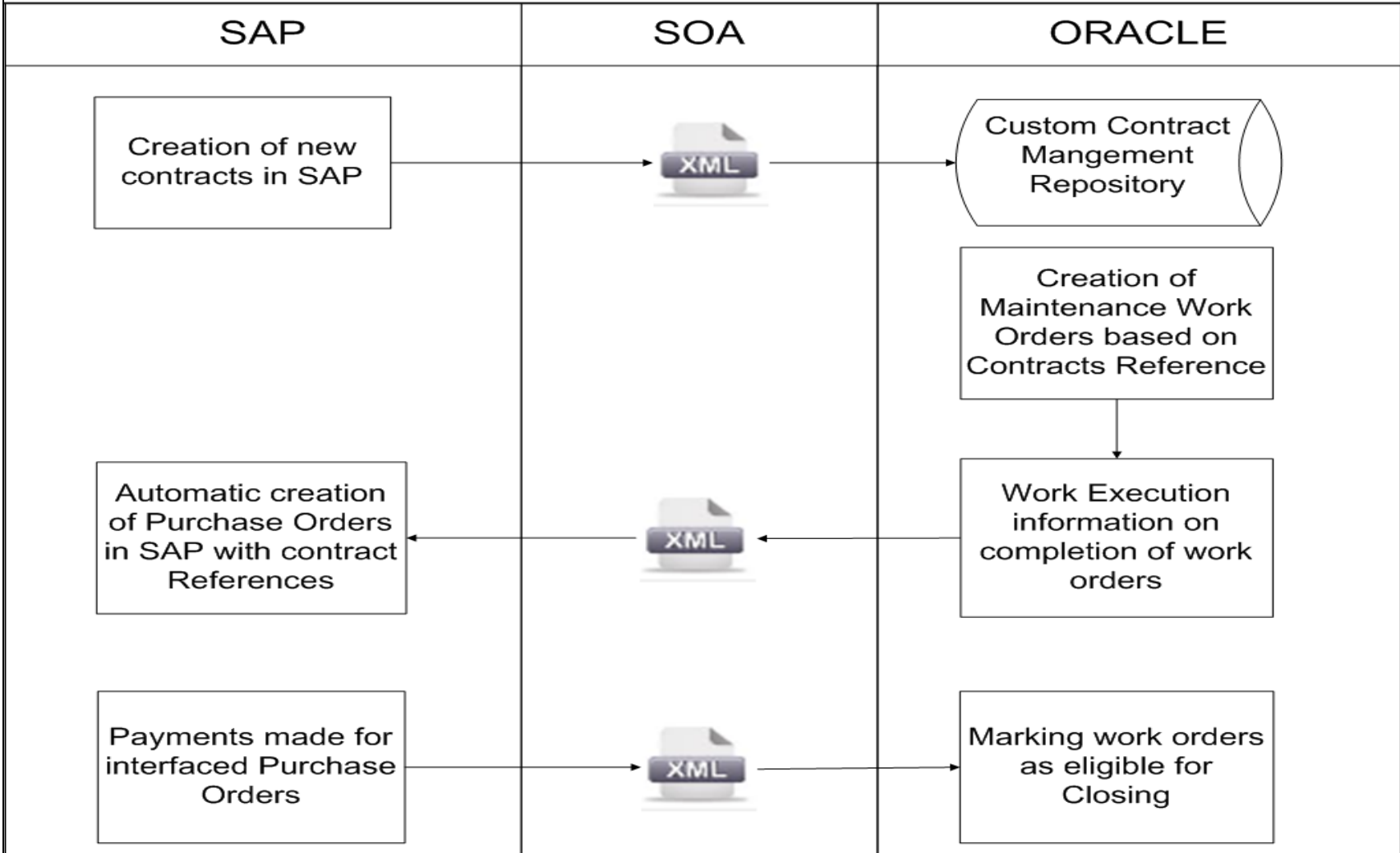
[Select All](#) | [Select None](#)

Select	ITEM CODE	DESCRIPTION	ALLOCATED QTY	ON-HAND QTY	DIFFERENCE	MIN	MAX	LEAD TIME	QTY(PO AWAITING)	QTY(PR AWAITING)	PURCHASE GROUP	QTY-REQ
<input type="checkbox"/>	MM00001	MM00001		10		15	50	12			265	<input type="text"/>
<input type="checkbox"/>	62006251	integration test	28	0	-28						265	<input type="text" value="28"/>
<input type="checkbox"/>	62006250	integration test	16	0	-16						265	<input type="text" value="16"/>
<input type="checkbox"/>	62006249	integration test	20	0	-20						265	<input type="text" value="20"/>
<input type="checkbox"/>	62006248	integration test	80	0	-80						265	<input type="text" value="80"/>
<input type="checkbox"/>	62006247	integration test	40	10	-30						265	<input type="text" value="30"/>

# Integration points with SAP

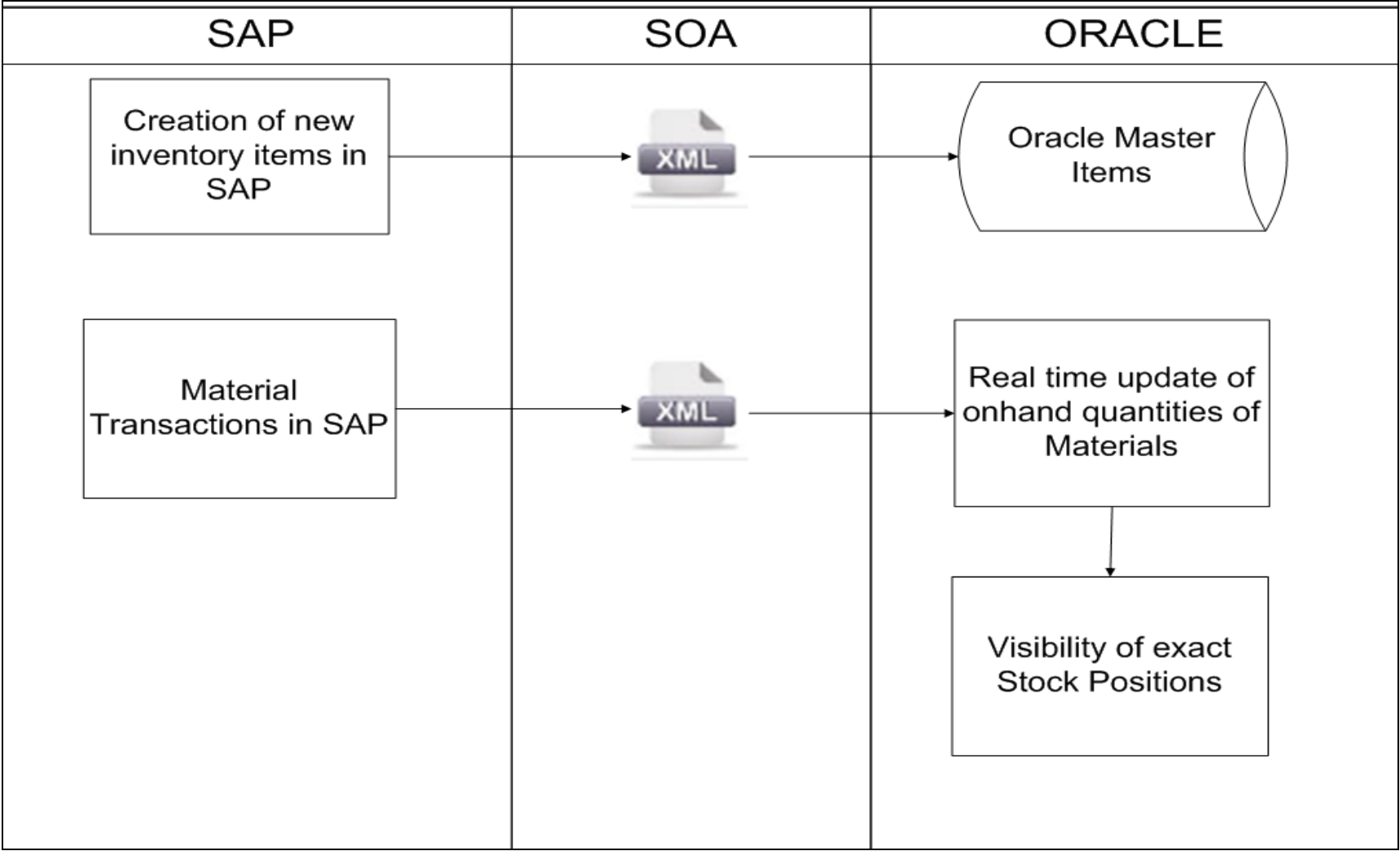
- **Contract management**
- **Material Management**
- **Material Planning**
- **Employee Data base**

# Contracts Management

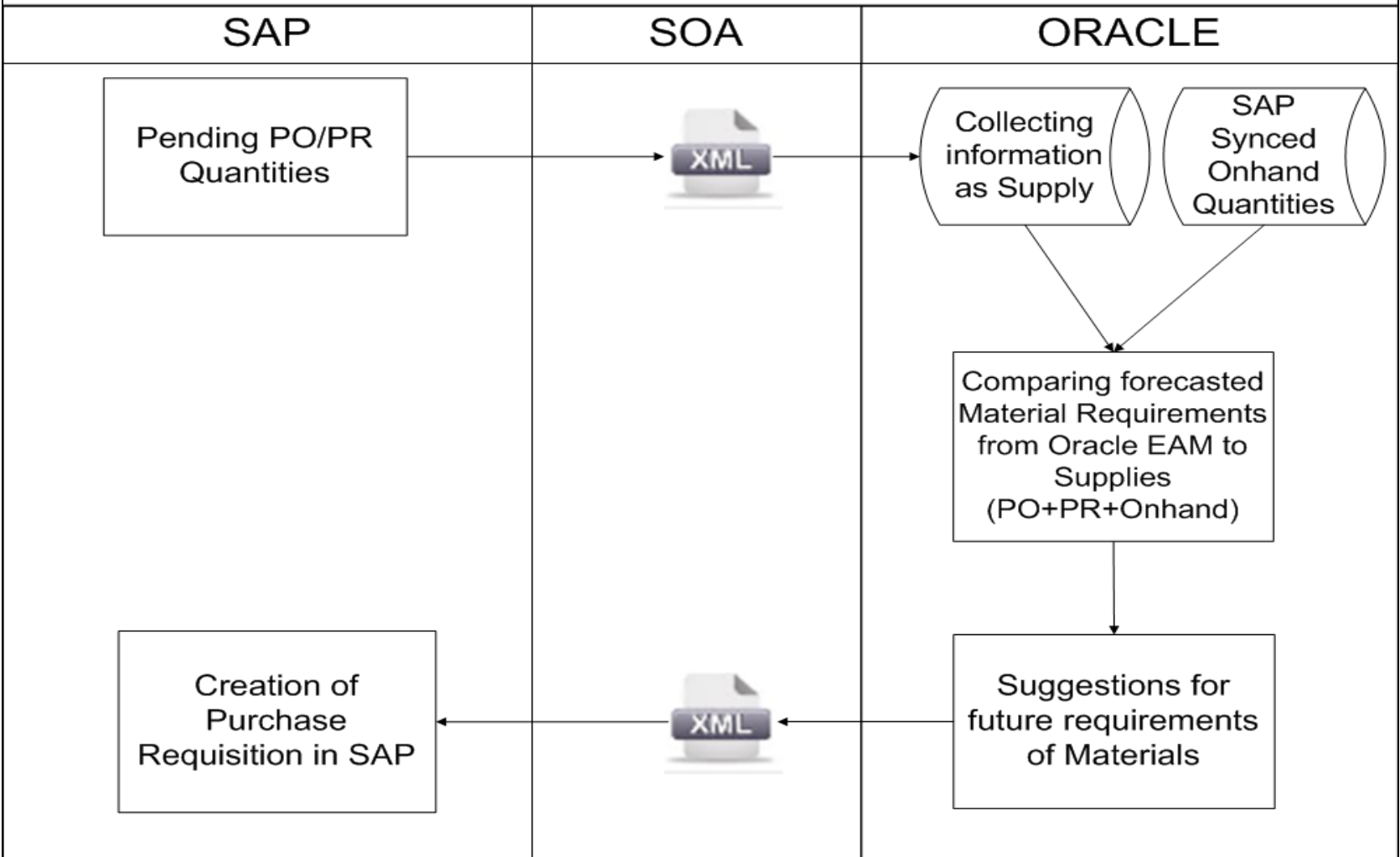




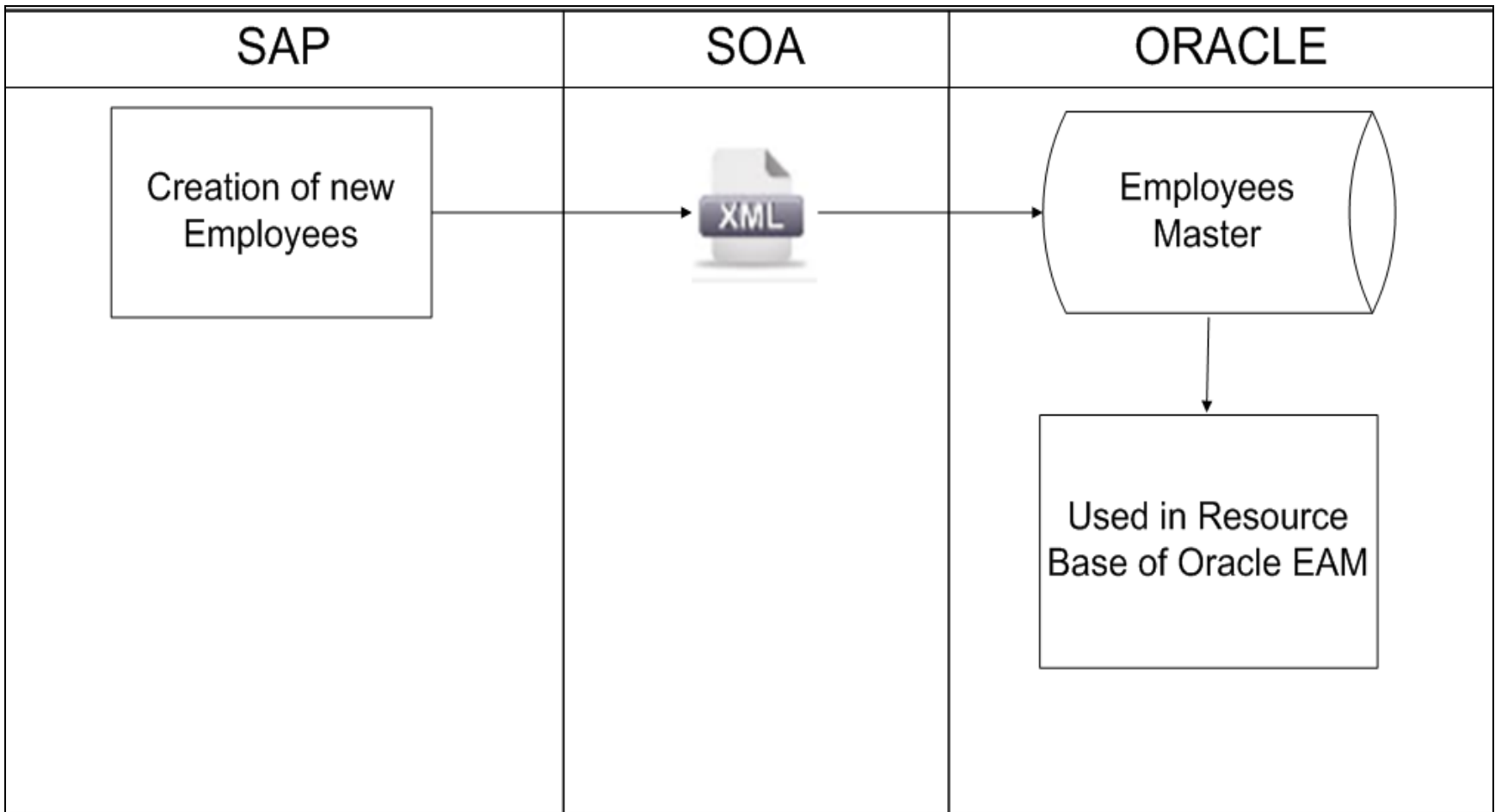
# Materials Management



# Material Planning



# Employees Database



# Business Benefits

# Oracle EAM Benefits

- Manage the full asset lifecycle with a complete view of your assets/equipment maintenance History
- Drive maintenance best practices and improved organization's performance
- Role-based user interfaces based on an employee's responsibilities.
- Other benefits like Failure Analysis, Cost Management, Rule based Preventive Maintenance and many more.

# Synergies from Integration



- The Solution is a comprehensive Facility Management Information System which provides following benefits-
  - Control and Compliance with Maintenance Contracts of both Materials and Services
  - Real time availability of information from SAP like on hand quantity of materials increased the accuracy in Maintenance Operations.

# Synergies from Integration



- Custom Material Planning Solution provided Material Planners tool to consolidate Supply from SAP and Demand from Oracle and take decision accordingly.
- Availability of updated Employees data allowed helpdesk to keep log of employees requesting services and Maintenance Supervisors in scheduling of Maintenance Crew.

# Overall Benefits

- A single maintenance system throughout the organization
- Better integration between stores and maintenance
- Comprehensive asset and component history
- Focus on preventative maintenance, driving better asset reliability
- Better management of maintenance workload
- Standardised asset information and maintenance procedures
- Ability to analyse asset and maintenance department performance



# Questions?



# Thank You



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