Integrated Petroleum Supply Chain – A Refining & Marketing Companies Approach

Mark W Evans
CIO & VP of Corporate Services, Tesoro Corporation
Tesoro (Petroleum) Corporation

Independent Refiner & Marketer of Petroleum Products

- Operates six (6) refineries in CA, WA, UT, ND, AK and HI with processing capacity of 560,000 barrels of crude oil per day
- Operates 577 Tesoro Retail Stations of which 216 are Company Owned
- Operates Mirastar Stations at Wal-Mart Locations
Tesoro IT Environment

- SAP is the Primary Business Application
  - Extensive Use of Core Modules and Industry Specific Modules
  - Approximately 1997 Users
  - Two Production Instances HR and IS-Oil
  - Use BW for Business Intelligence / Data Warehousing
  - Successfully Scaled from One Refinery, $900 Million, Company in 1998 to Six Refinery, $12 Billion, Company Today

- Have Six (6) Additional Enterprise Commercial Systems
  - Supply Chain, Risk Management, Retail Operations, Pipeline Operations, Refinery Yield Management, and Pricing
  - A Hand Full of Legacy Systems Remaining Since 1999 SAP Go Live
Tesoro IT Environment

- Standardized, Cost Effective and Stable Infrastructure
  - Single Operating System: MS Windows 2000
  - Single Database: Oracle
  - Standard Network: Cisco
    - 179 Major Locations, 5407 Network Nodes
  - Standard Data Servers: EMC – SAN with 9 Terabytes of Data Stored
  - Standard Server Hardware & PCs: Compaq/HP
    - 259 Servers, 4127 PC Devices
  - Single Data Center on San Antonio

- Total of 126 Company IT Personnel with 89 Contractors
Business Objective:

- To maximize shareholder value by creating the Tesoro Way. The Tesoro Way includes a common culture, standard processes, and clear organizational roles and responsibilities.

Creating the Tesoro Way will enable us to:

- Align the organization and key processes with the business strategy
- Quickly extract anticipated value from mergers / acquisitions through standard, scalable processes
- Be profitable in a low-margin environment
Achieving true business transformation requires strategic change across three business elements: People, Process, and Technology.

All three business elements work as a system, complementing each other and acting as checks and balances for ongoing operations.

Project Rising Star presented recommendations for all three elements.
Project Rising Star - Transformational Approach

70 Processes (Phase 1)
- Scope of Phase 1 – Current State Assessment
- Identified based on top-down approach using the business process taxonomy tool
- Confirmed based on bottoms-up view of future state priorities
- Included priorities of Senior Management

14 Current State Themes (Phase 1 and 2)
- Accumulation of all current state findings
- Shouldn’t be confused with processes – not a one for one match
- Presented to Leadership Team

6 Macro Processes (Phase 3)
- Basis for future state design workshops
- Macro-processes include:
  - Optimization
  - Origination to Settlement (O2S)
  - Commercial Excellence
  - Loss Control
  - Capital Budgeting
  - Services

Key Focus of this Presentation
Statement of Benefits - People

- Business model supports recommended processes
- Based on concept of “Centralized Functional Excellence”
- Natural work team concept central to business model success
- Culture and reward system tied to optimizing overall corporate performance
- Model evolves through an orderly transition over next 5 years
### Business Model for O2S - Origination to Settlement

<table>
<thead>
<tr>
<th>Front Office</th>
<th>Middle Office</th>
<th>Back Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deal Capture</td>
<td>Credit Analysis</td>
<td>Rack Sales Analysis</td>
</tr>
<tr>
<td>Schedule &amp; Manage Inventory</td>
<td>Trading Controls</td>
<td>Settlement</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Contract Management</td>
<td>Tax</td>
</tr>
<tr>
<td></td>
<td>Master Data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inventory Accounting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GL Accounting &amp; Reporting</td>
</tr>
</tbody>
</table>

**Operations**

**Services**
Statement of Benefits - Process

- Consolidation and centralization of similar activities to ensure standardization, foster expertise and enable scalability
- Cross-functionally design processes increase efficiency of hand-offs between organizations
- Clear alignment of processes, roles, and responsibilities with business decisions
- Collaboration and decision ownership is structured through natural work teams
- Increased emphasis on analysis and information sharing drives better decisions
Level One Business Process for O2S

1.0 Supply Planning, Company Position

1.1 Develop Demand Forecast
1.2 Develop Production Plans

2.0 Pre-Trade Analysis

2.1 Macro Analysis
2.2 Micro Analysis

3.0 Deal Capture

3.1 Issue Contracts
3.2 Manage Commodity Risk

4.0 Schedule Logistics

5.0 Actualize Movement

6.0 Crude Option Selection

7.0 Control Loss
8.0 Manage Demurrage

9.0 Settle Transaction

10.0 Analysis Results
The “company position” is the starting and end point of all operational activities.

It sets the foundation for a comprehensive view of all hydrocarbon requirements and exposures of the organization.

It is a key enabler to various components of the redesigned origination to settlement processes.
Single Deal Capture System for All Commercial Activities

Execution of all front office activities will be enabled by a deal capture system capable to handle all transaction types including financial trades and marketing contracts.

Timeliness and accuracy of information capture along the process will be enhanced by an intelligent master data infrastructure and workflow capabilities.

A pricing engine capable of interpretation of pricing conditions through the settlement point will simplify settlement and increase the accuracy of the company position.
Tesoro’s O2S Business Process Model

**Deal Capture**
- Mid Office Physical Trade Mgmt
  - Physical Trade Ops
  - Portfolio Mgmt
  - Position Mgmt (physical)
  - Expense Mgmt
  - Profitability

**Trading Decision Support & Optimization**
- Mid Office Operations
  - Demand Forecasting
  - Inventory Mgmt
  - Nomination
  - Scheduling
  - Vessel Chartering
  - Ops Management

**Physical Trade Management**
- Mid Office Physical Trade Mgmt
  - Physical Trade Ops
  - Portfolio Mgmt
  - Position Mgmt (physical)
  - Expense Mgmt
  - Profitability

**Complex Risk Management and Modeling**
- Paper Mgmt
  - Paper Trade "Ops"
  - Paper Instrument Mgmt (Futures, Swaps, Options etc)
  - Hedging
  - Value at Risk
  - Paper Positions

**Logistics Operations Management**
- Back Office Execution Mgmt
  - Security & Controls
  - Authorization Concept
  - Credit Check
  - Invoicing & Settlement
  - Accounting
  - Payments
  - Documentation
  - Financials

**Financial Execution and Management**
- Simulation
  - Scenarios
  - Positions What-Ifs
  - Risk Optimization
  - Analysis

**Enterprise Reporting and Analysis**
- Reporting
  - Review & Analyze P&L
  - Complete Position Reporting
  - Audit Reporting
  - Market Performance
  - Custom Reporting

**Market Tracking & Analysis**
- Deal Capture
  - Market Prices
  - News (e.g. Reuters)
  - Crude Output
  - Refinery Outputs
  - Correlations
  - Trends etc

**Front Office Role driven Portal**
- Deal Capture
  - Paper Deal Capture
  - Deal Assignments

**Front Office Trading Support**
- Trading Decision Support & Optimization

**Front Office Real-Time Links**
- Financial Execution and Management
  - Market Prices
  - News (e.g. Reuters)
  - Crude Output
  - Refinery Outputs
  - Correlations
  - Trends etc

**Front Office Trading Support**
- Market Tracking & Analysis

**Front Office Trading Support**
- Deal Capture
Statement of Benefits - Technology

- Achieve benefits designed in people and process
- Support most (all known) requirements of the business community
- Provide the optimal return on investment for functionality support
- Maximize/Leverage the current investment in SAP for reporting, analysis and additional functionality
- Support a consolidated information structure
- Leverage existing resource/skills in IT
O2S - Origination to Settlement – Heterogeneous

Front Office | Middle Office | Back Office

- Spreadsheets
- Spreadsheets
- SAP BW / SEM

<table>
<thead>
<tr>
<th>3rd Party or Home Grown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule &amp; Manage Inventory</td>
</tr>
<tr>
<td>3rd Party or Home Grown</td>
</tr>
<tr>
<td>3rd Party</td>
</tr>
<tr>
<td>3rd Party</td>
</tr>
</tbody>
</table>

- Customized Integration
- Risk Management
- Contract Administration
- Accounts Payable
- Treasury
- Bills

- SAP R/3 & Manual
- SAP R/3
- SAP BW / SEM
- Customized Integration
- 3rd Party or Home Grown
- Schedule & Manage Inventory
- 3rd Party
- 3rd Party

© SAP AG 2005, Integrated Petroleum Supply Chain / Mark W Evans / 18
Available SAP Solutions

For Physical Trade
- Trade Capture
- Position Management
- Expense Management

SAP Global Trade Management

For Paper Trade & Risk Mgmt
- Futures deal capture
- Hedging
- Value-at-Risk etc

SAP Treasury & Risk Mgmt

For Operations, Scheduling & Execution
- Nominations
- Scheduling
- Inventory Management
- Financials

IS-Oil Downstream + TSW

For Reporting
- GTM
- RM
- TSW
- IS-Oil
- mySAP ERP
- ...

SAP Business Warehouse
SAP Integrated Petroleum Supply Chain Model

Integration Required

TSW and IS-Oil / mySAP ERP

mySAP BI (BW and SEM)
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Heterogeneous</th>
<th>Homogeneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionality</td>
<td>Disparate applications may have a high level of functionality. Excessive “bells and whistles” functionality rarely used</td>
<td>Functionality may be less in certain application areas. Supports GET - Good enough technology.</td>
</tr>
<tr>
<td>Implementation, Complexity, Speed</td>
<td>Disparate applications increase implementation complexity and timelines. Phasing very difficult increasing the implementation timelines.</td>
<td>Compatible modules allows a more orderly phasing with less rework and complexity. Usually faster to implement complete solution</td>
</tr>
<tr>
<td>Investment</td>
<td>Requires capital outlay for disparate applications and expense funding for training, and consulting. Significant integration expense required.</td>
<td>Tesoro already owns the SAP modules for the homogeneous environment. Costs limited to training and implementation.</td>
</tr>
<tr>
<td>Talent / Skills</td>
<td>Tesoro IT does not have the headcount or skills for multiple vendor application solution. Will require significant IT headcount increase</td>
<td>Tesoro IT very skilled with SAP environment. Adding modules results in moderate / incremental headcount increase</td>
</tr>
<tr>
<td>Criteria</td>
<td>Heterogeneous</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Upgrades / Patches</td>
<td>Upgrading disparate applications significantly increases the difficulty, timeliness, and complexity. Significant coordination effort.</td>
<td>Upgrades easier to coordinate and implement. However, can be complex</td>
</tr>
<tr>
<td>On-Going Maintenance</td>
<td>Disparate environment makes it very difficult and slow to troubleshoot technical issues. Resolution coordination extremely difficult with multiple vendors</td>
<td>Single environment does not reduce complexity but eases coordination via a single vendor (SAP)</td>
</tr>
<tr>
<td>Process / Change</td>
<td>Change management degree of difficulty very high. Process handoffs difficult between disparate applications.</td>
<td>Change management degree of difficulty probably higher because of SAP. Process handoff smoother within single environment.</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Management</td>
<td>Disparate environment requires significant effort to aggregate data for information use. Disparate data structure requires significant consolidation.</td>
<td>Single environment provides a consolidated information structure. Strong point for homogeneous environment</td>
</tr>
</tbody>
</table>
## Due Diligence - Heterogeneous versus Homogeneous

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Heterogeneous</th>
<th>Homogeneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Benefit Capture</td>
<td>Significantly longer time required to fully capture business benefits due integration issues.</td>
<td>No real short cut to benefit capture, but time required to capture is much less than the alternative approach</td>
</tr>
<tr>
<td>Vendor Relationships</td>
<td>Significant effort required to maintain multiple vendor relationships. Very difficult when problems occur.</td>
<td>Risky having “All the eggs in one basket”. Coordinating problem resolution easier. Single account management</td>
</tr>
<tr>
<td>Vendor Strength</td>
<td>Disparate solution vendors face increasing market consolidation and encroachment by large vendors. Financial staying power always questionable</td>
<td>Market consolidation on-going with the larger vendors getting bigger. Superior financial strength. However, few alternatives.</td>
</tr>
<tr>
<td>Market Responsiveness</td>
<td>Financial strength impacts response to shifts in market and technology. Request for new functionality usually result in “custom or one-off” solutions.</td>
<td>Customers can be “the tail wagging to dog”. Larger vendors have a formal process for enhancements. Can take longer to obtain, but once commitment is made, they usually follow through.</td>
</tr>
</tbody>
</table>
Conclusion

- A conceptual technology solution path was designed through a collaborative effort between Tesoro and SAP
- The proposed solution path features a homogenous architecture approach based on the existing SAP platform
- The solution will minimize the use of in-house developed and non-SAP applications and Tesoro or Integrator developed integration interfaces

- Potential Benefits to the homogenous approach
  - Exploits initial investment to support functional requirements
  - Reduces significantly the ongoing IT support costs.
  - Focuses on leveraging internal IT staff skills versus introduction of new unknown technology solutions.
Next Steps

- Tesoro recognizes the value of a homogeneous solution and is pursuing a SAP based platform architecture to address the major technology opportunities arising from the Project Rising Star.
- To be successful, a feasibility study is in-process to determine the functionality and availability of solutions to meet Tesoro’s business requirements. The study proposed to:
  - Assess potential technology options with a focus on the SAP platform.
  - Visit/work with SAP AG for education and exposure to the SAP integrated petroleum supply chain platform.
  - Validate through education, exposure and prototyping that proposed SAP technology platform is a fit for the business. Identify gaps.
  - Develop FEL plans including appropriate cost benefit analysis.
  - Prototype solution alternatives to assess technical and functional feasibility.
  - Prioritize solutions and develop potential implementation plan.
  - Involve appropriate thought leaders in the business community through the course of the study.
  - Obtain approvals from Business Executives and PMO EPRC (Executive Project Review Committee) to initiate the solution implementation.
Origination to Settlement FEL Time Line

- Origination
- Stakeholder Education – SV RFP Process
- FEL Preparation
- FEL Project
- BOD Presentation
- FEL Phase Change Management
- Mgmt Approval
- Final Version
- 2nd Draft
- 1st Draft
- Mgmt Decision
- Phase 1 Delivery - TBD

- JAN
- FEB
- MAR
- APR
- MAY
- JUN
- JUL
- AUG

2005
Questions?

Integrated Petroleum Supply Chain

Mark W Evans
mevans@tesoropetroleum.com
(210) 283-2930