Enterprise-Service Oriented Architecture for Chemicals

Leverage Enterprise SOA for Chemical Companies

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Senior Solution Architect
IBU Chemicals
Enterprise Services What is it?

Enterprise Services Community

A practical example – Ocean Carrier
Key Challenges for Business & IT in Chemicals

SAP's Solution
Key Business Challenges in Chemicals

Differentiation and Business Innovation for top line growth

- Globalization/New Market Entry
  - Increase speed to enter new markets
  - Support of business decisions on a global level

- Product Portfolio Management
  - Merger/De-Merger
  - Spin-Offs (Commodities, New products)

- Profitability/Margin Optimization
  - Improve Customer Profitability Analysis
  - Support of controlling and planning of the operations

- Product and Process Innovation
  - Reduce time to market for new Products
  - Leverage the reuse of existing knowledge and assets

- Operational costs Reduction
  - Increase utilization of asset mix
  - Optimize the supply chain

- Compliance Requirements
  - Short-dated resolving of regulatory issues (e.g. REACH (EU), SOX)

The Drive for Growth creates Continuous Change
Key IT Challenges in Chemicals

Composition that leverage existing investments

Consolidation & Standardization of technologies

Globalization/New market entry
- Support of Process Template Strategy by the system landscape
- Increase Security of Systems (e.g. IP Issues)

Product Portfolio Management
- System/Process Integration (R&D, Sales,…)/ Split up of systems
- Flexibility for System Consolidation/ landscape harmonization

Profitability/ Margin Optimization
- Improved customer-related analytical capabilities
- Optimize alignment of business goals with operational controlling

Operational Cost Reduction
- Support of standards (e.g. supply chain collaboration, LIMS Integration)
- Access to MES/ Automation Layer

Product/Process Innovation
- Enable access to knowledge across departments
- Support of complex Production/SCM Processes (Long running)

Compliance Requirements
- Short-dated implementation of reporting requirements
- Collection, consolidation and deliver of data in different formats

IT Needs Flexibility to Support Change
The main objective of "service enablement" is to (efficiently) free the business logic from the applications.
Definitions: What is a Service?

- **SERVICES**
  are set of linked, repeatable business tasks.

- **SOFTWARE SERVICES**
  are self-contained, reusable software modules with well-defined interfaces and are independent of applications and the computing platforms on which they run.

- **WEB SERVICES**
  are self-contained and self-describing application functionalities that can be processed through open internet standards.

- **ENTERPRISE SERVICES**
  are choreographed web services that support a business scenario which reduces the implementation effort of web services for that scenario.
# Chemicals Solution Map

<table>
<thead>
<tr>
<th>Suppliers &amp; Partners</th>
<th>Develop</th>
<th>Plan</th>
<th>Source</th>
<th>Make</th>
<th>Deliver</th>
<th>Sell &amp; Serve</th>
<th>Customers &amp; Channels</th>
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- **Research & Development**
  - R & D Management
  - Product Development

- **Supplier Collaboration**
  - Strategic Sourcing
  - Procurement

- **Supply Chain Planning & Execution**
  - Supply and Demand Planning
  - Distribution and Transportation
  - Order Fulfillment
  - Inventory Management

- **Manufacturing Planning & Execution**
  - Manufacturing Operations
  - Enterprise Asset Management

- **Sales & Marketing**
  - Sales and Operations Planning
  - Opportunity Management
  - Inquiry to Contract
  - Order to Cash

- **Customer Service**
  - Complaints and Returns Management
  - Product Information Management

- **Quality Management & Compliance**
  - Quality Management
  - Compliance Management

- **Enterprise Management & Support**

Key Challenges in Chemicals

SAPs Solution
Business Process Platform: Integration & Collaboration

Service Transport: HTTP
XML Messaging: SOAP
Service Description: WSDL
Service Discovery: UDDI

A survey released in November by AMR Research shows that more than 78% of 500 respondents across major vertical industries and company sizes are currently using or considering software-as-a-service. Only 18% said they have no plans to consider software-as-a-service.

What's behind on-demand software's rise
By John Fortane, Network World, 12/12/05

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SAP Bridges the Gap Between Business and IT

Consolidation and Standardization for higher Productivity

Composition for differentiation while leveraging existing investments

Evolutionary adoption of Services and moving towards an open service-oriented architecture

Reusable application components for fast and efficient Solution composition
WHAT ARE THE TOOLS FOR COMPOSITION?

**User**
- Various experiences & rendering technologies
  - User Experience & Rendering Technologies

**Business Analyst/Process Expert**
- Guided procedures
- Work Center
  - Guided Procedures
  - Work Center

**Model**
- UI Composites
  - Visual Composer
  - Model

**Orchestrate**
- Process Composites
  - Business Process
    - Models
  - Orchestrate

**Construct**
- Information Composites
  - BI reports, analytics, MDM
  - Adobe forms, CM, text search
  - Construct

**Reuse**
- Process Components
  - Included in next major release of NetWeaver

**Service Creation & Composition**
- Composite Application Framework
  - Service Creation & Composition

**Create**
- Software Components
  - Programs (Code)
  - Create

**Developer/Programmer**
- Work Center
  - Business Process Models
  - Orchestrate

**Enterprise Services Repository**
- SAP
  - SAP
  - Other Sources
  - SAP NetWeaver - Composition Environment
Key Challenges in Chemicals

SAPs Solution

**How does Enterprise SOA equal flexibility**

How to start with Enterprise SOA?
Idea: Use Open Web Standards

Service Transport: HTTP
XML Messaging: SOAP
Service Description: WSDL
Service Discovery: UDDI

```xml
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <getProductDetails xmlns="http://warehouse.com">
      <productID>827635</productID>
    </getProductDetails>
  </soap:Body>
</soap:Envelope>
```
Service enabling consists of two aspects:

- From a *technology* perspective, the SAP system has to support communication based on the Web Services standards stack.
- From an *application* perspective, the SAP system has to provide meaningful services to prospective client applications.

**Application Services:**
- ABAP
- Java
- Web-based
  - Standard
  - Custom

**Web Services Technologies:**
- XML
- XSD
- WSDL
- SOAP
- BPEL4WS
What are Enterprise Services?

Enterprise Services are Web services that have an enterprise level business meaning. These are typically an aggregation of application (or web) services of lower granularity combined with simple business logic to support a step of a business process.
Example: “Order Create”

With just web services, coordination of the individual services is left up to implementation to support the business process.

An Enterprise SOA service includes the business logic & coordination of the various web services & other Enterprise Services that make up the complete business process.
Example: Enterprise SOA Service - Replacing a service

Individual services can be replaced without disrupting the Enterprise Service Business Logic.
Example: Enterprise SOA Service – Reusability

An Enterprise SOA can be reused in multiple business scenarios.

- Standard Customer Mgmt Quote to Order Process
- Payment
- Delivery
- Invoice
- Quotation
- Enterprise SOA Service Order_Create

Custom Business Process
What does that mean?

With Enterprise Services a business scenario is:
- Easier & Faster to build
- Of Higher Quality
- Easier to Implement & Operate
- Scalable
- Upgradeable
- Reusable

With Enterprise Services 3rd Party Solutions are:
- Easier to install
- Easier to upgrade
- Cheaper to operate over their life time
- Easier to integrate into existing business processes

Without Enterprise Services, it will be difficult or impossible to integrate new solutions into the existing processes & landscape.
Key Challenges in Chemicals

SAP’s Solution

Why ESA SOA?

How to start with Enterprise SOA?
ES Workplace - A Short Introduction

The new ESA Exploration System is the next-generation ESA Preview System. Based on the success of the ESA Preview System, the new ES Workplace gives you access to browse and test the newly productized enterprise services. Productized services are those that SAP provides and ships to our customers for use in their own systems. These productized enterprise services have been built to support Project Dust (SAP-Microsoft Office integration) and are available as an add-on for customers using mySAP ERP. You can expect the number of productized services to increase tremendously over time, reflecting more partner and customer input. The original 500 preview services are still available, in addition to the new services.

- Use SAP Business Maps to visualize enterprise services in their business context and to understand the business definitions of the service-enabled components.
- Get a user ID and password for the ES Workplace where you can drill down to WSDL definitions and start testing enterprise services and applications that consume services (limited availability).
- Provide feedback and collaborate with peers on your experience with the ES Workplace.

Find out more about ES Workplace.
Find out more about Enterprise Service - key concepts of ESA.

Understand Service Definitions in Their Business Context

ES Workplace encapsulates SAP business know-how and industry best practices as a set of service-enabled objects and components. mySAP Business Suite provides the environment and context where the services are active. The ES Workplace brings together navigational tools that help you locate enterprise services and understand how they support key business processes.

- Use Solution Maps to locate services in their business context
- Use the alphabetical Service Index to locate services within their functional areas

Learn how to navigate through the ES Workplace Inventory (PDF 1.5 MB).

Build Applications that Consume Services

Jumpstart your enterprise services know-how by building test apps that interact with the live system. Get access to the ES Workplace and develop client applications in ESA. Using productized enterprise services (instead of preview services) will allow you to later deploy them in your own system environment.
Enterprise Service Workplace

ES Workplace

The ES Workplace is designed to make Enterprise Services Architecture more tangible and accessible. It serves as a focal point for feedback that will help shape the final Enterprise Services creation. There are two options for browsing, testing and using enterprise services along strategic business processes: You can either view the complete index or browse by business context within the appropriate Solution Map.

Enterprise Services (Alphabetical Order)

- Enterprise Services Index

Enterprise Services in (generic) business context along Solution Maps

SAP Solution Maps focus on core competencies and challenges, thereby helping you visualize, plan, and implement a coherent, comprehensive solution for profitable growth. They show the main business processes relevant to specific industries. By browsing through these respective business processes, you will identify the key enterprise services and how they support those key business processes. Drill-down details are also provided to show various implementation options, their availability, as well as to clarify business guarantees, pre-conditions, post-conditions, and message choreography.

- mySAP ERP

Enterprise Services in industry business context along Solution Maps

Besides the general business context, we will continue to provide enterprise services in the industry business context. Look for the icon that will lead to processes enabled with enterprise services. The initial focus industries are as listed:

- Chemicals
- Consumer Products - Food
- High Tech - Business, Medical & Consumer OEMs
- High Tech - Electronics Manufacturing Service Provider (EMS/ODM)
- Professional Services
- Public Sector

The Solution Maps are part of the SAP Solution Composer which helps you visualize, plan, and implement coherent and comprehensive IT solutions that integrate business processes within your enterprise and between organizations. Download the latest version of the SAP Solution Composer to create company-specific business maps to document, plan, and design a customized solution.
SAP Discovery System for Enterprise SOA - On YOUR Desk

The SAP Discovery System for Enterprise SOA is a fully configured SAP landscape for innovation and exploration. In partnership with Intel, SAP is making this cost-effective hardware available as a self-contained physical server. With this system you can:

- Test drive Enterprise SOA today, in your environment.
- Get hands-on experience with a practical example of an Enterprise SOA-enabled composite application.
- Interact with a showcase of both today’s technology and upcoming solutions, including SAP Analytics.

Based on SAP Best Practices

We’ve fully documented the configuration of this SAP Discovery System for Enterprise SOA landscape so you can be up and running quickly. We also provide detailed guidance to re-deploy the included scenarios and/or key pieces of content in your own development environments. Since the components in the system scan mySAP ERP, SAP NetWeaver solutions, and non-SAP solutions, you can see how a true heterogeneous landscape can be managed by SAP.

Prototyping, Development, and Learning Environment

With this system, you will accelerate your team’s learning and experience. This system is a fully documented prototyping and development environment with a working procurement example to evaluate real data in a real system. The complete composite application code is provided. You will gain skills and experience with Enterprise SOA, cutting your time to the value of an Enterprise Services Architecture.

When Will It Be Available?

The first release of the SAP Discovery System for Enterprise SOA was announced at Sapphire, and will be made available through various SAP technology partners. Initially, the SAP Discovery System will be available...
HP DL380G4 3.6GHz: SAP
Discovery System for enterprise
SOA Powered by HP

System price $8,999.00
From $8,999.00

Lease for as low as $243.87/month
(36 months)²

Apply online

Shipping and tax not included. Details
Estimated Ship Date: 7/7/2006³

Customize your configuration

Product
HP DL380G4 3.60Hz J60001 Server with SAP

Recommended supplies and accessories

ProLiant Essentials software

- 414735-B21 HP P2P Single Migration License [Add $198.00]

http://www.hp.com/go/server/sap
How to get there: Enterprise Services Architecture Adoption Program

Discovery
- Grasp the Vision
  - ESA and SAP NetWeaver Vision Value Session
  - ESA Opportunity Workshop
  - TCO Discovery Session

Evaluation
- Build Your Own Roadmap
  - ESA Enabling Roadmap Workshop
  - ESA Roadmap Workshop

Implementation
- Go Live
  - Plan Services
  - Build Services
  - Run Services

Operations
- Show the Value
  - Continuous Operations and Governance
  - ESA / NetWeaver Community
  - Become an ESA leader in your industry

- Comprehensive and scalable consulting program by SAP and partners
- Series of logical steps to simplify the journey toward ESA
- Ties process improvements with value assessments, application portfolio and technology lifecycle planning
- Customized toward the specific situation and challenges
- Cross-organizational approach driving alignment of business and IT
Phased Path Towards an Integrated ESA World by addressing current value-adding topics

- **Business Driven**
  - Process Efficiency
  - Process Flexibility
  - Process/Business Model Innovation

- **IT Driven**
  - Demonstrate the business value (3-6 months ROI)
  - Explore the full business potential (6-12 months ROI increments)
  - Build the foundation (6-12 months ROI increments)

- **Value**
  - Business Performance Management
  - Multi-channel Customer interaction
  - Shared services and out-tasking
  - Enterprise Services Repository

**Commit to ESA blueprint**

**Leverage “business platform” for flexibility**

**Invest in “applistructure” for lower TCO**
Enterprise Services What is it?

Enterprise Services Community

A practical example – Ocean Carrier
SAP Enterprise Services Community Overview

esc@sap.com
# Value Proposition of the Enterprise Service Community

The value of the Enterprise Services Community lies in its ability to directly impact the business requirements and technical architecture of the SAP platform by fostering targeted, business-driven feedback from the Community.

<table>
<thead>
<tr>
<th>Role</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>Customers</td>
<td>will be able to create more cost-effective, interoperable, customizable and flexible business process solutions.</td>
</tr>
<tr>
<td>ISVs</td>
<td>will be able to leverage the depth and breadth of SAP’s platform, reducing development time, driving down integration barriers and freeing resources for innovation.</td>
</tr>
<tr>
<td>SIs</td>
<td>will be able to reuse Enterprise Services shifting their focus from IT integration to business process integration.</td>
</tr>
<tr>
<td>Infrastructure providers</td>
<td>will be able to tap into SAP’s cross-industry platform infrastructure and industry-specific application suites to become more application-aware and adaptable to business processes.</td>
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Enterprise Services Community

Allows partners and customer to influence and define Enterprise Services

Industry Value Networks
Powered by SAP NetWeaver

ASUG/DSAG

Other

Customer and Partner Groups

SAP

ENTERPRISE SERVICES REPOSITORY

ENTERPRISE SERVICES PROPOSAL

Definition Groups

ES COMMUNITY

Customers

Technology Partners

SIs

ISVs

SAP

ISVs
Enterprise Services Community Groups

**Review Definition Groups** *(Modify before we build)*
Review Definition Groups are input and comment mechanisms for the services SAP has identified, giving SAP a robust process for receiving and taking advantage of ecosystem feedback.

**Request Definition Groups** *(Make your unique requirements heard)*
Request Definition Groups can be industry and/or SAP application focused. The Definition Groups can consist of customers and/or partners or any combination thereof.

The output from Request Definition Groups can vary in granularity from being quite general descriptions to very concrete Enterprise Service specifications.

**Advisory Groups**
Advisory Groups will give input and feedback regarding the Enterprise Services Community Process, methodologies and tools provided or required.

Advisory Groups will be run in the same pattern as Definition Groups.
Membership Benefits

Enterprise Services Inventory
Access to all Enterprise Service definitions that SAP and the community have created.

Definition Groups
Opportunity to participate in Definition Groups to request and review Enterprise Services.

Access to Beta Enterprise Services
Access the betas of Enterprise Services throughout their implementation

Enterprise Services Registry
Evaluation and Development Licenses for Enterprise Services and access to hosted Enterprise Service Implementations by SAP

Certification
Ability to certify consuming Enterprise Services as “ES Ready” through SAP Test Administrator

Commercial License
Commercial license to ship products that consume Enterprise Services
Community Participation

Membership
Every company interested in becoming a Member will need to sign the Enterprise Services Community Membership Agreement.

Agreement
The Membership Agreement mainly consists of an NDA and the rights to evaluate SAP’s Enterprise Services Architecture.

Additional Exhibits governing IP and licensing rights will be added for each Definition Group a Member participates in.

The Evaluation of specific Enterprise Services and the development of consuming Enterprise Services also requires the addition of an Exhibit.

Agreement Process
The addition and updating of Exhibits will be made available through click-through licenses once the ESC if fully operational,

Annual Fee
A nominal membership fee becomes due when joining the community.

Customers are exempt from this fee
Enterprise Services What is it?

Enterprise Services Community

A practical example – Ocean Carrier
SAP SCM 5.0 Add-On
Transportation Management
Ocean Carrier Booking & Visibility
Streamlining the Management of Ocean Shipments
SAP’s Transportation Management Solution

A significant amount of SAP R&D Investment is benefiting the SCM Discipline:
- Transportation Management
- Warehouse Management
- Supply Chain Event Management
- Supply Chain Collaboration
- RFID
- Global Trade Services
- Business Intelligence
- Customer Relationship Management
- Master Data Management

“SAP’s Transportation Management Applications to Help Companies React Profitably to Change Across Global Supply Chain Networks Through Adaptive and Automated Processes”

BERLIN, Germany - October 19, 2005 - SAP AG (NYSE: SAP) today announced it is gearing its comprehensive transportation management applications to help companies further optimize revenue across the operations that currently account for up to 60 percent of overall logistics spending. Building on its best-in-class supply chain applications and road map for adaptive business networks, SAP is embedding its existing transportation software with new capabilities enabling companies to sense and respond quickly and profitably to the fast pace of change in today’s competitive transportation environment.

“This upgrade makes SAP’s transportation solution competitive to best-of-breed solutions from vendors like Manugistics or Manhattan Associates,”

— Noha Tohamy, principal supply-chain analyst at Forrester Research
### Ramp-Up Program to support initial customer adoption

#### Ramp-Up Timeline
- The Ocean Carrier Booking & Visibility solution is part of an Add-on for SCM 5.0 and will be introduced via a Ramp-Up program

#### Backoffice Support
- Nomination process to select customers
- On-going project monitoring to ensure customer success
- Close cooperation between consulting and backoffice

#### Ramp-Up Contacts
- North America: Ken Siebritz - kenneth.siebritz@sap.com
- EMEA, APA, LA: Bjoern Bernard – bjoern.bernard@sap.com

#### More info?
- [SCM Ramp-Up Page on Service Marketplace](#)
Continued Growth and Focus on Transportation Processes

**Business Processes**
- Manage trucks & trailers as well as compartments (1)
- Plan decreasing capacities in multi-stop environments (2)
- Ocean Carrier Booking & Visibility (3)

**Industries**
- Chemical, Oil & Gas (liquid bulk transportation), CP, Retail (1) & (2)
- CP, Food, Hi-tech, Automotive, Mill Products,… (3)
  → any company that exports/imports internationally

**Value & Benefits**
- Manage individual transportation assets more efficiently
- Streamline paper-intensive booking process involving various parties
- Avoid manual work & comply to government regulations

**Enterprise SOA**
- Manage ocean shipments in a fully enterprise SOA enabled scenario
- Collaborate with ocean carriers through major booking platforms (INTTTRA, Cargosmart) with the help of enterprise services
SAP SCM 5.0 Add-on TM – Selected Benefits

**Truck & Trailer Planning**
- Make better use of individual transportation assets by avoiding down times
- Increase ability to plan, maintain and execute a private fleet
- Model drop & hook scenarios
- Avoid sending trailers to locations where it can’t be un-loaded (height or weight restrictions)

**Compartment Planning**
- Plan to concurrently transport different liquids/products (e.g. grades of fuel)
- Opportunity to consolidate liquid bulk orders from different customers on one truck/trailer
- Restrict dangerous goods to certain compartments only
- Model incompatibilities between freight units in one compartment
- Avoid exceeding legal weight limits

**Planning for Decreasing Capacities**
- More granular planning approach for multi-customer-stop scenarios
- Segregate trailers into different compartments and consider decreasing capacities

**Ocean Carrier Booking & Visibility**
- Overcome process limitations in ERP (order sequence, sales order processing)
- Avoid necessity for custom development (booking logic based on sales orders e.g.)
- Reduce manual input of data (fax, phone, email)
- Global visibility of shipping status & compliance to government regulations (customs e.g.)
- Out-of-the-box connectivity to ocean carrier community by supporting standard processes
- Close the loop between transportation processes and order management processes
### Ocean Carrier Booking & Visibility – Streamlining the Management of Ocean Shipments

#### Customer Pain Points
- Pre-defined, limited business process in ERP Logistics Execution, requires always sales order purchase orders and (at least!) deliveries before transportation planning and booking. Early reservation of vessel capacity not possible today.
- Manual communication or custom development in exports and imports
- No visibility, compliance and complex communication to multiple carriers
- Manual input and user input errors cause avoidable costs for error correction

#### Business Process & Solution
- **Booking of Ocean Vessel Capacity**
  - Reserve capacity with a variety of ocean carriers
  - Pre-booking possible
  - Receive booking confirmation
- **Shipping Instructions**
  - Support for complex booking requirements
  - Send shipping details/instructions
- **Ocean Visibility and Security**
  - Integrated business process monitoring with event management
  - Get status updates from carriers on container level to adhere to custom regulations

#### Value & Benefit
- **Higher Business Productivity**
  - avoid manual input and user errors by automating capacity reservations
  - Faster carrier interaction and better service by carriers
- **Higher Business Flexibility**
  - reserve capacity (container space on ocean carriers) long before a sales order exists for a customer
  - plan own and/or other containers in a single transaction
  - comply to government regulations by providing real-time information on location of containers
- **Lower TCO**
  - avoid custom development to overcome process limitations
  - tightly integrate standard industry platforms (INTTRA, Cargosmart) into the my SAP SCM environment

#### Target Customer
- **Industries:**
  - CP, Food, Hi-tech, Automotive, Mill Products, Retail,…
  - any R/3 or mySAP ERP customer that is using Logistics Execution System (LES) and is involved with international shipping requiring to reserve capacity with ocean carriers
Technical Scope: Integration of Logistics Service Providers

Sales Specialist/Procurement Specialist

Ocean Carrier (LSP)

Transportation Planner

Ocean Carrier (LSP)

Transportation Planner

Booking Request

Booking Confirmation

Assign Shipments to Booking & Send Shipping Instructions

Transportation Execution

Transportation Monitoring

SAP NetWeaver

mySAP ERP

Industry Platforms (INTTRA, Cargosmart,..)

mySAP SCM

Logistic Service Providers (Ocean Carriers)

Enterprise Services

EDIFact/ANSI/ISA Standard Interfaces
Ocean Carrier Booking & Visibility – Streamlining the Management of Ocean Shipments

**Ocean Carrier Booking & Visibility**

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**Connectivity to multiple Ocean Carriers via one platform**
SUMMARY

1. ESA enables innovation & productivity through flexibility and the support of open standards
2. Boost productivity through the adoption of best industry practices
3. Investigate ESA on SDN
4. Start your roadmap to productivity improvement by starting the ESA journey Today
5. Starting Point: SAP Solutions Powered by SAP NetWeaver
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