Service-Oriented Modeling and Architecture: from Business Intent to IT Realization

OMG SOA/WS/MDA workshop
Orlando, FL, March 21-24 2005

Luba Cherbakov, Distinguished Engineer
IBM Global Services
Agenda

- **Bridging Business-IT Gap**
  - Component Business Modeling
  - SOA

- **Service Oriented Modeling and Architecture Overview**
  - Overview
  - Example

- Q/A
Greater flexibility is required from business models and the supporting IT. *Service-Oriented Modeling and Architecture (SOMA)* provides in-depth guidance on how to move from business models to the models required by an SOA.
Agenda

- **Bridging Business-IT Gap**
  - Component Business Modeling
    - SOA

- **Service Oriented Modeling and Architecture Overview**
  - Overview
  - Example

- Q/A
The IBM Component Business Modeling (CBM) framework is an alternative to traditional views of a business - the building block of a component business model is a ‘business component’

A component is a business in microcosm. It has activities, resources, applications, infrastructure. It has a governance model. It provides goods and services (business services)

**Business Component Elements**

- Each business component has differentiated capabilities
- Each business component defines and decides on the use of all resources needed to perform the defined activities
- Each business component has a governance structure within which it manages its activities
- Each business component has business services which form the interfaces to other business components

Composable Processes (IBM Component Business Modeling)

Composable Services (SOA)
We use a Business Component Map as a tabular view of the business components in scope.

A **Business Component** is a part of an enterprise that has the potential to operate independently, in the extreme as a separate company, or as part of another company.

### Business Competencies
Columns are **Business Competencies**, defined as large business areas with characteristic skills and capabilities, for example, product development or supply chain.

**Composable Processes** (IBM Component Business Modeling)

**Composable Services** (SOA)

**An Accountability Level** characterizes the scope and intent of activity and decision-making. The three levels used are Directing, Controlling and Executing.
- **Directing** is about strategy, overall direction and policy.
- **Controlling** is about monitoring, managing exceptions and tactical decision making.
- **Executing** is about doing the work.

**Example component business model for the credit card industry**
CBM can be very helpful in framing client issues
Example 2: sourcing

Example component business model for the credit card industry

1. We can highlight non-differentiated capabilities that present potential opportunities for alternate sourcing strategies
2. We can identify candidates for Business Transformation Outsourcing
3. We can identify candidates where there are Utility offerings
4. We can identify partners with better capabilities
CBM can be very helpful in framing client issues

Example 3: technology

1. We can map existing applications infrastructure onto the business map
2. We can identify where there are systems *duplications*
3. We can highlight where there are *gaps*
4. We can highlight where systems have been *overextended*
Agenda

- **Bridging Business-IT Gap**
  - Component Business Modeling
  - SOA

- **Service Oriented Modeling and Architecture Overview**
  - Overview
  - Example

- Q/A
What is Service-Oriented Architecture?

"SOA in context …"

Business

Architecture

SOMA focus

Implementation
An SOA is composed of multiple layers that decouple the provider and consumer views.
Agenda

- **Bridging Business-IT Gap**
  - Component Business Modeling
  - SOA

- **Service Oriented Modeling and Architecture**
  - Overview
  - Example

- Q/A
At the heart of SOMA is the identification and specification of processes (flows), services, and components that will realize them.

**SOMA activities are grouped into three major steps**

- **SOMA Identification** discovers candidate services, enterprise components and flows.
- **SOMA Specification** makes service exposure decisions, and specifies the services and enterprise components to realize them.
- **SOMA Realization** captures realization decisions.
Agenda

- **Bridging Business-IT Gap**
  - Component Business Modeling
  - SOA

- **Service Oriented Modeling and Architecture**
  - Overview
  - Example

- Q/A
### Rent-a-car “hot” components

<table>
<thead>
<tr>
<th>Marketing &amp; Customer Mgt.</th>
<th>Products</th>
<th>Rentals management</th>
<th>Rental Fleet Logistics</th>
<th>Business Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Segmentation</td>
<td>Rental Product Strategy</td>
<td>Location &amp; Channel Strategy</td>
<td>Fleet Strategy</td>
<td>Corporate / LOB Strategy</td>
</tr>
<tr>
<td>Marketing Strategy &amp; Planning</td>
<td>Channel Design &amp; Layout</td>
<td>OEM Relationship Planning</td>
<td>Real Estate Planning</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Behavior Modeling</td>
<td>Promotions Management</td>
<td>Channel &amp; Location Profitability</td>
<td>OEM Performance Management</td>
<td>Alliance Management</td>
</tr>
<tr>
<td>Market &amp; Competitor Research</td>
<td>Pricing Management</td>
<td>Location Operations Management</td>
<td>In-bound Logistics</td>
<td>Business Performance Reporting</td>
</tr>
<tr>
<td>Segmentation Management</td>
<td>Call Center</td>
<td>Reservations Management</td>
<td></td>
<td>Legal &amp; Regulatory Compliance</td>
</tr>
<tr>
<td>Call Center</td>
<td>Campaign Management</td>
<td>Workforce Management</td>
<td></td>
<td>Real Estate &amp; Construction Management</td>
</tr>
<tr>
<td>Execute</td>
<td>Customer Service</td>
<td>Purchasing / Sourcing</td>
<td>Rentals &amp; Reservations</td>
<td>Risk Management</td>
</tr>
<tr>
<td></td>
<td>Preferred Member Mgmt</td>
<td>Demand Forecasting</td>
<td>Time &amp; Attendance</td>
<td>Stock Ledger</td>
</tr>
<tr>
<td></td>
<td>Customer Communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass Marketing &amp; Advertising</td>
<td></td>
<td></td>
<td>HR Management (Career Dev., Training, Recruiting)</td>
</tr>
<tr>
<td></td>
<td>Target Marketing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Location Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fleet Servicing</td>
<td>Location Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fleet Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EXAMPLE**

For illustration only
Rent-a-car Rentals and Reservations “hot” component with collaborating components, component descriptions and business process

Rentals & Reservations
- Offered Service: Vehicle Availability
- Consumed Service: Rent Vehicle
- Reserve Vehicle
- Check Rates
- Customer Profile
- Location Promotions
- Location Information
- Check-In Vehicle
- Check-Out Vehicle

Customer Service
- Execute level Biz component: Responsible for servicing the customer; Offers, among other things, services relating to maintenance of customer profile

Promotions Management
- Control level Biz component: Responsible for the management of promotions across the board

Fleet Management
- Execute level Biz component: Responsible for providing services around Fleet management, Fleet availability, etc

Rent Vehicle Business Process
- Reserve Vehicle
- Check-out Vehicle
- Check-in Vehicle

For illustration only
## Rent-a-car Goals and Key Performance Indicators (KPIs)

<table>
<thead>
<tr>
<th>Goal</th>
<th>KPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase the speed and agility in delivering new business services</td>
<td>Time to deliver a new business service = 2 wks</td>
</tr>
<tr>
<td>Streamline processes to reduce operating costs</td>
<td>Operating cost reduction from July 2004 levels = Reduce by 20% after deployment of services platform</td>
</tr>
<tr>
<td>Increase Revenue by 20% by the end of FY2005</td>
<td>Revenue increase in FY2005 over FY2004 = 20%</td>
</tr>
</tbody>
</table>

**Goal:** Business aspiration, usually high-level

**KPI:** Measurable Objectives
SOMA identifies services through three complementary techniques:

- Domain Decomposition (Top Down Analysis)
- Existing Asset Analysis (Bottom-up Analysis)
- Goal-Service Modeling

Diagram:

- Domain Decomposition
- Goal-Service Modeling
- Existing Asset Analysis

- Helps Scope Service Identification Process
- Align Services with Business Goals
- Identification
- Specification
- Realization

Bottom-up Analysis
Rent-a-car Domain Decomposition Analysis

Domains

Functional Areas

Domain

Marketing & Customer Management

Products

Rental Fleet Logistics

Rentals Management

Functional Area

Customer Service

Promotions Management

Fleet Management

Rental

Reservations

Pricing

EXAMPLE

For illustration only

0. Rent Vehicle

1.1 Reserve Vehicle

1.1.1 Check Rates

1.1.1.1 Get Location (pick-up/drop-off)

1.1.1.2 Get Date/time (pick-up/drop-off)

1.1.2 Make Reservation

1.1.2.1 Confirm Rental Information

1.1.3 Choose Vehicle

1.1.3.1 Confirm Customer Information

1.1.4 Get Options Information

1.1.4.1 Get Payment Information

1.1.5 Check Vehicle Availability

1.1.5.1 Confirm Reservation

1.1.6 Offer Rates For Selection

1.2 Check-out Vehicle

1.2.1 Locate Reservation

1.2.1.1 Get Location (pick-up/drop-off)

1.2.2 Modify Reservation

1.2.2.1 Get Customer Information

1.2.3 Create Rental Agreement

1.2.3.1 Get Payment Information

1.2.4 Sign-out Vehicle from Lot

1.2.4.1 Confirm Reservation

1.3 Check-in Vehicle

1.3.1 Locate Rental Agreement

1.3.1.1 Get Location (pick-up/drop-off)

1.3.2 Process Return Information

1.3.2.1 Get Customer Information

1.3.3 Process Payment

1.3.3.1 Get Payment Information

1.3.4 Return Vehicle to Lot

1.3.4.1 Confirm Reservation
Rent-a-car Top-Down service identification

- Business processes: process choreography
  - Reserve Vehicle
  - Rent Vehicle
  - Check-out Vehicle
  - Check-in Vehicle

- Services: atomic and composite
  - Rent Vehicle
  - Check-out Vehicle
  - Check-in Vehicle

- Components

- Existing applications

Identification
Specification
Realization

Example
For illustration only
Rent-a-car Goals, sub-goals as recorded in the Goal-Service Model, and services identified for sub-goals

Goal-Service Model

- Increase Revenue by 20% by the end of FY2005
  - Introduce New Products
  - Introduce New Channels
  - Increase Revenue per transaction
    - Up-sell higher class vehicle
      - Understand Customer Profile
      - Determine types of Up-sell vehicles
      - Check vehicle availability
    - Cross-sell additional options
      - Purchase options individually
      - Purchase option packages
    - Cross-sell Partner services
      - Reserve Hotel rooms
      - Reserve Airline tickets
      - Book destination attractions
      - Sell Navigation equipment post-rental
**Rent-a-car** Existing Asset Analysis examines existing applications to discover functions that may become service realizations.
Rent-a-car Specification and Realization activities complete analysis and design
Agenda

- Bridging Business-IT Gap
  - Component Business Modeling
  - SOA

- Service Oriented Modeling and Architecture
  - Overview
  - Example

- Q/A