Operations Support Systems

Global Telecommunications

The Numbers: Billions and Trillions
- $1.2 trillion revenue in 2006 (VGMP Magazine)
- 5.9% annual growth (Insight Research Corp, 2007)
- 2.7 billion mobile phone users in 2006 (Informa)
- 1.2 billion Internet users in 2007 (InternetWorldStats.com)

More and More Services

Material Challenges
Data accuracy is one challenge that telcos face in managing their business
- 40-60% of telcos’ Network Inventory data is inaccurate
- 3-11% of gross revenue is lost to error

OSS: Managing Complex Data

Role in telecommunications
- Users
- Service Management
- Network Management
- Customer Service
- OSS
- Network Elements

The OSS Industry
- $21.5 billion revenue in 2006 (Gartner 2006)
- Highly fragmented

OSS Market Share (by Revenue)

<table>
<thead>
<tr>
<th>Company</th>
<th>Accuracy</th>
<th>Complete</th>
<th>IBM</th>
<th>Comverse</th>
<th>NetScape</th>
<th>Oracle</th>
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OPPORTUNITY FOUND
Telcos are searching for the perfect OSS to manage their networks

WANTED ALIVE!
Accomplices to telcos’ dream OSS

Compatibility
Adaptability
Law Compliance

Features: Difficult to determine. Recognition requires intense market research and understanding of telecommunications industry standards, enterprise management, and United States Law.

ELUSIVE, BUT EXTREMELY HELPFUL

Reward: $21.5 billion
Total OSS market revenue in 2006 (Gartner, 2006)

We have identified these accomplices and present our recommendations to Comarch:
eTOM: Enhanced Telecommunications Operations Map

The Enhanced Telecommunication Operations Map (eTOM) is a framework of best business practices for the telecommunications industry. eTOM has become the de facto standard for analyzing and building tools to automate telco business processes.

Understanding eTOM

- **eTOM Level 1**
  - Vertical Groupings
    - Perspective of business model
    - Planning at the left
    - Transaction completion at the right
  - Horizontal Groupings (Layers)
    - Process at the top
    - Suppliers at the bottom

eTOM in Practice

- IT Forms
- TM Forums
- Telcos
- Projects, service support

eTOM Recommendations to Comarch

- **Comarch's Goal**
  - Value-Add Through Pre-Made OSS Templates

Our Experience in Creating Templates

- Identification of eTOM processes is critical
  - Find key words in process names, then descriptions
  - Place in vertical and horizontal groupings
  - Use the interactive eTOM map

Other Ideas...

- Database to search keyword density in eTOM process names
- Link commonly-sequenced/related eTOM processes (Process X usually followed by Process Y, eg.)

ESB: Enterprise Service Bus

The Enterprise Service Bus (ESB) architecture is emerging as the preferred platform for enterprise data communication. ESBs make business services reusable and widely available to users, applications, business processes, and other services.

ESB Recommendations to Comarch

1. **Develop Integration with Top ESB Providers**
   - Best products „picking”
   - Risks:
     - Will need adapters for all of Comarch’s products
2. **Develop Comarch ESB Solution**
   - Demand for ESB „OSS in a box”
   - Risks:
     - Difficult to develop ESB
   - New market, potentially value-add bundle with OSS solution

SOX: Sarbanes-Oxley Act

The Sarbanes-Oxley Act (SOX) was passed by the United States in 2002 to prevent corporate fraud in large public companies. To succeed in the US market, it is essential that Comarch understand and ensure SOX compliance.

Understanding SOX

- Executive Accountability
- Internal Control
- External Accountability
- SOX Compliance

Paying for SOX

“...SOX costs for public companies with a market capitalization between $75 million and $700 million will...equal, on average, approximately $900,000.”

– US Securities & Exchange Commission, April 2006

SOX Recommendations to Comarch

Comarch's Current Situation

<table>
<thead>
<tr>
<th>Concern</th>
<th>Findings</th>
<th>Comarch’s Status</th>
<th>Actual SOX Compliance depends on the client, not on Comarch!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Availability</td>
<td>SOX data contained in Comarch OSS:</td>
<td>SOX Compliant</td>
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<tr>
<td>and Retrieval</td>
<td>• Service Level Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inventory Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Service Provisioning</td>
<td></td>
<td></td>
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<tr>
<td>Access Control</td>
<td>Comarch OSS provides readily assigned user profiles for secure and limited access</td>
<td>SOX Compliant</td>
<td></td>
</tr>
</tbody>
</table>

Our Suggestions

- Ask telco: Project vs. Process based on SOX compliance?
- Market SOX to European and US Telcos

Ideas...

- Ensure SOX compliance in products outside OSS
- SOX Consulting (draw on experience with clients)