Web Services in the Oil Industry

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Petrotechnical Open Software Corporation
OMG Web Services Workshop
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Web Services in the Oil Industry

Or ...

Transforming Oil & Gas Exploration & Production Technical Information Exchange Across the Internet
Presentation Outline

- **Context** –
  - Oil Industry Data Exchange: A History
  - POSC in the Oil Industry

- **Results** –
  - Web Services Seminars
  - Web Services Pilot Implementation

- **Plans** -
  - Industry Problems WS May Address
  - Challenges – Problems WS May Create
  - POSC Web Reference Services
Oil Industry Data Exchange

- This is one of the most collaborative and interdependent industries
  - Many core functions outsourced for decades.
  - Many other core functions have been internally sourced to central expertise groups.

- Result:
  - Early development of data exchange standards
  - But,
    - using specialized, often non-portable, formats,
    - communications using private networks.

It’s all about context and vocabulary!
POSC in the Oil Industry

- Formed by five major oil companies in 1990
- To set standards for integration through data stores
- Commercially neutral
- Specifications first published in 1993
- Distributed object specs published in 1999
- First XML spec published in 2000
- Focus on deployment and integration
POSC in the Oil Industry

- Roles throughout technology / development cycles:
  - Early
    - help stimulate interest
    - brings parties together
  - Middle of a cycle
    - develop => implement => deploy => value
    - coordinate, facilitate, encourage, ...
  - Late
    - supports standards
    - take custody of ad-hoc specifications
    - smooth evolution
In mid-2001, Shell, the UK Department of Trade and Industry, IBM, and POSC developed a Web Services pilot implementation.

A 3 server plus registry scenario:

- A regulatory agency employing a just-in-time data acquisition philosophy seeks specific types of data from oil companies.
- Two oil companies pre-positioned data accessible via registered web services.
- Regulator is referred to the oil company services by the registry and receives the requested data. Transmission logged and acknowledged. Voila!
Oil&Gas Industry registers their shared applications

Enquiry about available reports

Register services

Request data & reports via GUI

Request data & reports through automated processes

Secure exchange over the Internet

1

2

Operating Units

Company Data

Well header data

Well production data

SHELL

Requesting data from oil&gas companies

Enquiry about available reports

Register services

Oil&Gas Industry registers their shared applications

Secure exchange over the Internet

Company Data

Well header data

Well production data
Flow for updated location maps

Submit to Company A

Move data to temp store

Submit to Company B

Receive Information and create updated drawings

Backend processing

Verify and log request

Retrieve data

Return data to DTI

Verify and log request

Retrieve data

Return data to DTI

Submit to Company B

Retrieve data

Return data to DTI

Receive Information and create updated drawings

Submit to Company A

Retrieve data
Web Services Seminars

- The four partners organized two by-invitation seminars to present the notion that Web Services are both relevant and ready for use to industry leaders.
- October in London / November in Houston
- Over 40 participants in each
- Agenda:
  - Presentations from each partner
  - Demonstration of the pilot
  - Discussion groups
Goals of the Seminars

- Explain Web Services
  - Technology Development
  - Standards Development
  - Business Applicability

- Demonstrate an actual implementation

- Have the participants explore the potentials
  - Identify suitable business processes
  - Identify challenges: technology and/or cultural

- See if one or more consensus paths forward emerge ➔ follow-up with action
Web Services Seminars

What did the four pilot implementation partners have to say?

Here is a sample – the UK DTI and POSC
Regulator: UK’s DTI

- Web Services are compatible with the government directive to Web enable all government services in a very short period of time
- Key information flows from oil companies to DTI
  - Requesting permission to …
  - Reporting results from …
  - Receive answers to requests from …
- Key information flows from DTI to others
  - Pass on information received to …
  - Pass on requests received to …
  - Distribute answers received to …
The UK DTI’s Information Strategy

Just in time v Just in case

- Receive and store information used regularly only for necessary business functions.
- Information needed occasionally should be stored / retained elsewhere by third parties, e.g., accessible national data repositories.
- Define appropriate standards for storage and exchange of Information (XML schemas), e.g., for production volume reporting.
- Audit companies to ensure that they are satisfying their data retention obligations.
Industry Standards: POSC

- Facilitate collaborative development on a non-commercial basis
- Facilitate development of standards for terminology and context
- Develop and/or manage XML standards for Web services
  - Leverage what already exists
  - Develop those which are needed
- “Start at the edges and work in from there”
- Be guided by requests from member organizations
Web Services Seminars

What did we say about Web Services?
Here is a sample ...
Web Services: A New Web Model

- Until now, the Web has provided for browsing of linked documents, manually-initiated purchases and transactions, and downloading files -- all of this is manual, by way of a browser.

- Web Services is a new model for using the Web:
  - transactions initiated automatically by a program, not necessarily using a browser.
  - can be described, published, discovered, and invoked dynamically in a distributed computing environment.
  - new ways of using the web: intelligent agents, marketplaces, auctions.
  - all built on XML and other internet standards!

- The content-oriented web is now complemented by a services-oriented web.
Pilot Demo
Oil Industry / IBM Web Services Demonstration

Welcome to the Oil Industry Web Services Demonstration by IBM, DTI, Shell and POSC. Enabling the exchange of selected information with partners and government in a secure and automated environment.

Please log in:
User ID: as69r
Password: 

Log In
Oil Industry / IBM Web Services Demonstration

Oil Companies Found
- Norway Oil
- Shell

Extract all Company data
Oil Industry / IBM Web Services Demonstration

Company Information for **Norway Oil**

<table>
<thead>
<tr>
<th>CEO Name:</th>
<th>Jennifer Brown</th>
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<tr>
<td>CEO Telephone Number:</td>
<td>+44 (0) 2345 67890</td>
</tr>
<tr>
<td>CEO E-mail Address:</td>
<td><a href="mailto:jenniferbrown@bp.com">jenniferbrown@bp.com</a></td>
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<tr>
<td>CEO Secretary Name:</td>
<td>Malcolm Ledder</td>
</tr>
<tr>
<td>CEO Secretary Telephone Number:</td>
<td>+44 (0) 2345 12345</td>
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Oil Industry / IBM Web Services Demonstration

Well Completion Information for **Well2** from **Shell**

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Get chart for this well
Chart for Well ID Well2 from Shell

- 28.9
- 325.5
- 1448.0
- 2861.1
- 3207.1
Oil Industry / IBM Web Services Demonstration

Well completion aggregation

Well ID

- Well3
- Well4
- Well1

Depth

- Well3: 25.6, 245.9, 633.4
- Well4: 20.5, 480.3
- Well1: 24.4, 486.7

Shell
Norw
Oil
General Discussion -> Plans

- Priorities – Acorns – Value
  - Joint Venture Partner Data Sharing
  - Regulatory Obligations
  - Others
- Industry Standards / Vocabulary
- Registries – management cost
- Entitlement, Authentication, Trust
- Some “pull” data sharing already exists – motivation to upgrade / standardize
Plans: Next Steps

- Develop Implementation Pilots

- POSC Web Reference Services
  - Practical Well Log Standards
    - Web Application enabled for Web Services
  - Add More Reference Data Standards
  - ...

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Conclusion

For this industry, can Web Services …

1. Cut partner connection establishment costs?
2. Lead to new supply/service channels?
3. Usefully advertise in a WS registry?
4. Build up exchanged in intelligent, higher-level services?

Yes, to all …

1. Through standards base and market choice.
2. Next generation ASP’s.
3. The industry is always data hungry and can benefit from algorithmic services, too.
4. JV Partner Sharing, Regulatory, others.
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