Elevating spatial intelligence

Process-driven Architecture for Workflow Automation and GIS Integration

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In cooperation with: Gas Technology Institute
Agenda Topics

• What is a ‘Process-driven Architecture’?
• How is it used for Workflow Automation?
• And Importantly, GIS Integration?

• Why? What are the Business Benefits?
• Case Study
  • Regulatory Compliance
• Final Thoughts - Implementation Approach
Business Processes (in a GIS Context)

- Esri - 5 Components of a GIS
  - IT System + Geographic Data = GIS

- Other Key Component
  - Workflows - automated Business Processes
BPM Lifecycle

- Analyze / Improve
  - BPMN=As-Is
- Automate
  - BPMN=Executable
- Monitor
- Document
  - BPMN=To Be

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BPMN - Documenting

Activity Types

Control Flow

Sub-Process

Resources

Capture Field Inspection

QA Field Data

Data Integration and Notification

Field Pipe Inspection

QA Field Data

Approved?

No

Yes

Field Pipe Inspector

QA Manager

System Automation

Stakeholder Notification

Populate GIS

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BPMN - Process Abstraction

From Previous ‘Parent’ Process Diagram:
Why BPMN?

• Open **Standard** (OMG)
  • Supported by Numerous Software Vendors
  • Cross platform

• Intuitive and Collaborative
  • Graphic models + Shape Metadata
  • Production of Process Documentation
BPMS - Configure, Automate, Integrate

- Emerging Class of Software Tools
  - Gartner iBPMS Category
- “Low Code” Application Platform - Automate
  - Underlying Data Model
  - Data Entry Forms
  - Business Rules
  - Users and their Roles
  - External System Integration
    - via Web Services
BPMN for GIS - Case Study

• Support Regulatory Compliance
  • Tracking & Traceability

• Improve Operational Knowledge

• Leading to Better Customer Service
Login - Role-based Security
Form-based Data Entry
External System Integration

Pipe Mill

“Push”

SOAP API

BPMS

“Pull”

PO Data

REST API

ERP System
- SAP
- Oracle
- etc

External System Integration

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Harvesting Location Data

Addresses

Geolocation
Integrating Harvested Locations

BPMS – across the board
  • External System Integration support
  • via web services, esp. REST API

BPMS Data Entry
  • Address
  • Geolocation
  • Dates and Times
  • GIS Attributes

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### Integrating Harvested Locations

#### Entered Address
- Converted to Lat/Lon via Google Geocode API

#### Send to ArcGIS REST API

**Vendor Registration**

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<th>Value</th>
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<tr>
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<td>Tensing USA</td>
</tr>
<tr>
<td>Street Address:</td>
<td>9500 Belward Campus Dr, Rockville, MD, 20850</td>
</tr>
<tr>
<td>Date Added:</td>
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**QC**

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<td>Geocode Latitude</td>
<td>39.10499910</td>
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Information Products - Maps

- DocumentPoint Locations
Information Products - Maps

- Two-way Traceability with UPDM
Notifications w/Attachments

For Pipe ID: 3
Pipe Marking Type: Stencil
Marking Location: Exterior

Inspected Pipe Attributes:

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<tr>
<td>Outside Diameter</td>
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<tr>
<td>Wall Thickness</td>
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</tr>
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Attachment ObjectId: 802
Attachment Post Code: 200
Attachment Post Message: success

Uploaded Filename: cdv_photo_003.jpg

This is an automated message from the BPMN Process Manager
Please do not reply
Improving Operations

- Process Monitoring Information Products
  - Case and Task Duration
  - Task Status
- Containing Business Intelligence
- Decision Basis for Process Improvements
Implementation Strategy

- Start Small
  - Pick 1 - 2 processes
  - Lower complexity w/ Highest Impact
- Demonstrate **success** to build **support**
- Complements Agile Approach
Special Thanks to:
Gas Technology Institute