SYSTEM INTEGRATION AND BUSINESS PROCESS EMBEDDMENT EXTENDING
GEOSPATIAL VALUE CHAIN

Mark Freeburn, CEO
Valued Integration

Virtual Death by Example

Example IoT Integration

Example Safety Management Integration

Example AI Integration

Example Journey Management Integration
• **AAM Location Processor**
  - Started life as a spatial event processor (geo-events)
  - Spatial processing at core
  - Developed over time with changing technology needs
  - Multiple processors developed (not all spatial)

• **AAM IoT Processor**
  - Focus on event processing (including geo-events)
  - Spatial component optional
  - Multiple processors
  - Spatial components
    - From source (trackers, GPS etc.)
    - Derived (transformed) from attributes (lat/lon values)
    - At destination (fixed location events; updating exiting features)
    - Absent: data processing & transformation only
IoT Processor: What’s included?

**Installer**
- AAM IoT Processor Version 2.1.10 Setup
- Custom Setup
- Select the type of features to be installed.

**Console**
- Create & Configure Processors
- Example of IoT Integration

**Workflow Studio**
- Create bespoke workflows

*Image of the Console and Workflow Studio interfaces.*
Example IoT Integration

Input
- UDP CSV Receiver
- Tetra Collector
- Skytrac
- Site Sense
- NEC Smart Cities
- Outpost Central
- REST (receive)
- JCA Collector
- NEC Smart Cities
- FlightRadar24
- Fastwave
- AIS Collector
- FlightRadar24
- SkyConnect Tracker
- Skytrac

Transformation
- Run Workflow
- Add/Rename/Remove
- Copy
- Duplicate Filter
- Frequency Filter
- Join fields
- Speed Filter
- Custom

Output
- SQL Server
- ArcGIS
- File Geodatabase
- Web Socket Client
- UDP CSV Writer
- Web Socket Server
- Web Socket Stream
- Custom

ArcGIS

SQL Server

Custom

Integration & Processing
IoT Processor Examples

- City of Wellington: NEC Smart City Kites
- Outpost Central: weather loggers WA
- Asset Tracking: mine vehicles
BACKGROUND

- Operating between Roma, Dalby and Gladstone
- Variable mobile coverage
- DTVMR – Digital Trunked Voice Mobile Radio
- Operates using the Tetra standard
- Up to 700 digital radios
- Radio’s support:
  - Voice communications
  - Man-down alarms (include Lone worker)
- Standalone desktop application
- Unreliable handset register
DROVER

Digital Radio Operational Visualisation for Emergency Response (DROVER)

• Improve worker safety
• Visualise radio location with Origin assets for context
• Enable messaging to handsets
• Enable geofencing / exclusion zones
• Streamline emergency response
• Simplify investigations
Example Safety Management Integration
GEOCORTEX - VISUALISATION

- Visualise radio location with Origin context
  - Infrastructure
  - Facilities
  - Imagery
- Grouping
- Direction
- Speed

Example Safety Management Integration
GeoCortex workflows enables searches on both radios and infrastructure.
GEOCORTEX - HISTORY

Historic records can be easily filtered and analysed
GEOCORTEX - MESSAGING

GeoCortex workflows enables simple messaging to radios
GeoCortex workflows & ArcGIS GeoEvent enables the creation of geofences / exclusion zones

Example Safety Management Integration
GEOCORTEX - ALARMS

Dedicated Alarm and No GPS panels to streamline emergency response
FUTURE DEVELOPMENTS

Integrate additional real-time feeds

• Vehicles (IVMS)
• Production data feed & events
• Weather (storms and lightning)
• Bushfires

Improved Success Factors

• Competencies
• Third parties
The Problem

• Drilling is an expensive exercise for energy companies, at $50-$150million per well and $500K-$1million day rates.

• Before undertaking any new drilling activity, they evaluate all of the available well completion reports in the same area and geological context for ~17 hazardous event types.

• These reports are produced by different organisations across many decades and typically take 6-8 weeks for technical staff to poor through reams of documents, to summarise and analyse their findings before they start work.
The Solution

- AAM team developed a web application to allow users to simply mark up an area on the map around offshore wells of interest and send this as a select set to IBM Watson to a nicely summarised view in depth order of every drilling event for every well in the area.

- The Geohazards for Drilling application converted a process that typically took weeks/months to hours/days. Not only was the total time reduced but value of time spend significantly increased, where previously they spent 80% of time looking for information and 20% of time working out what to do with it, such as changes to well bore design or subtle changes in location or geological targets, now they spend 20% time working and 80% of time working out what to do. They also have the flexibility to use the map to drive Watson or use Watson to drive the map.
Woodside Energy Applications

Live demos of our Watson apps all day at booth 234 at #ibmwow @IBMWatson

IBM Watson and GEOCIRRUS

Woodside 3D
Natural Resource Management

- Oil Well Analysis
- Environmental Stress on Farms
- Soil Agro-Meteor Potential
- Managing Harvests and Timber Sales
- Forest Planning
- Hydrocarbon Prospecting
- Petroleum Exploration
- Integrating Exploration Data
- Modeling Citrus Disease
BACKGROUND

- Replace current manual processes with streamlined and improved business processes
- Increased visibility and traceability of vehicles and people in designated areas and beyond
- Increased visibility of all planned journeys
- Improve the timeliness of responses in the event of vehicle or journey incidents
- Visibility of private road usage which enables tax rebate claims
- Improved reporting on vehicle utilisation
Road pick-up survey from Newman to Port Hedland

Uses
- Engineering and Design
- JMP – Journey Management Plan
- Integration with logistics
  - Costs of travel
  - Accurate prediction for maintenance
- Asset tracking
- Value of supply chain
Start the Journey
Attach the Device

Example Safety Management Integration
Send for Approval

Example Safety Management Integration
Review route
Approver's view

Example Safety Management Integration

Journey Management System

Journey Plan Approval status

journeymanagement@royhill.com.au

Today, 12:45 PM
Haddrell, Peter

Hi
Your journey plan is Approved by Approver
Journey Description = demo
Journey Start Date/Time = 1/14/2018 2:35:04 AM
Journey End Date/Time = 1/14/2018 7:21:14 AM
Journey Report

Summary

<table>
<thead>
<tr>
<th>Destination:</th>
<th>Port Hedland Airport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Test journey planner</td>
</tr>
<tr>
<td>Planner:</td>
<td>Demo user</td>
</tr>
<tr>
<td>Expected Start:</td>
<td>4/9/2017 10:52 AM</td>
</tr>
<tr>
<td>Expected End:</td>
<td>4/9/2017 3:50 PM</td>
</tr>
<tr>
<td>Est Duration:</td>
<td>4.97 Hrs</td>
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<tr>
<td>Total Distance:</td>
<td>461.3 Km</td>
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<tr>
<td>Journey Id:</td>
<td>35ca8ec9-4b19-41d8-870f-ed97b647b189</td>
</tr>
</tbody>
</table>

Planner Email: demo@aamgroup.com

<table>
<thead>
<tr>
<th></th>
<th>Est. Running Cost</th>
<th>Est. Fuel (l)</th>
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</thead>
<tbody>
<tr>
<td>Sedan:</td>
<td>$324.29</td>
<td>42.44</td>
</tr>
<tr>
<td>UTE 2x4:</td>
<td>$345.51</td>
<td>64.12</td>
</tr>
<tr>
<td>UTE 4x4:</td>
<td>$385.18</td>
<td>72.89</td>
</tr>
</tbody>
</table>

Check Points

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Check-in Time</th>
<th>Check-out Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Camp 1</td>
<td>Checkpoint 1: Rail Camp 1</td>
<td>4/09/2017 02:42 PM</td>
<td>4/09/2017 02:42 PM</td>
</tr>
<tr>
<td>Driver Break</td>
<td>Break of 0:30 required for every 4:00 travelled.</td>
<td>4/09/2017 02:47 PM</td>
<td>4/09/2017 03:17 PM</td>
</tr>
<tr>
<td>End</td>
<td></td>
<td>4/09/2017 03:50 PM</td>
<td>4/09/2017 03:50 PM</td>
</tr>
</tbody>
</table>

Route Description