Energy Forum
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Houston, TX
energyforum.tibco.com

The TIBCO Insight Platform
1. Data on Fire
2. Data to Action

Michael O’Connell     Catalina Herrera     Peter Shaw
September 7, 2016
Analytics Journey with TIBCO

Source: Gartner (May 2015)
The TIBCO Insight Platform: Presentation flow

1. Data on Fire
   - The TIBCO Insight Platform
   - Part 1: Insight

Catalina: Spotfire Demo
   - Data Access
   - Data Wrangling
   - Charts
   - Maps

Michael
   - Deployment
   - Administration

2. Data to Action
   - The TIBCO Insight Platform
   - Part 2: Action

Peter: Spotfire Templates Demo
   - Contour
   - Robust Cluster Analysis
   - Supervised Learning

Michael: Spotfire Streambase Demo
   - Intelligent Equipment

Matt: Real-Time Production Surveillance
   - Update from Oxy

Michael: Wrap up
   - Community Resources
INTERCONNECT EVERYTHING

People & Processes

APIs

Data & Systems

AUGMENT INTELLIGENCE

Reporting & Dashboards

Data Visualizations

Streaming Analytics
The TIBCO Insight Platform

TIBCO Spotfire

Insights

Actions

TIBCO Streambase

TIBCO Open Spirit ++ TIBCO EMS, BW, ...

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Insights

Business Case
- Increase Productivity
- Grow Revenue
- Reduce Risk

Assemble Data
- G&G
- Well
- Production
- Historian
- SAP

Wrangling
- Visualize
- Clean
- Shape
- Merge
- Enrich
- Filter

Explore
- GeoLocation
- Completions
- Production
- Equipment

Present
- Dashboard

Develop Model
- Model
- Prediction
- Action

Decision, Action
- Production Interrupt
- Equipment Failure
- Drill Bit Movement

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Smart Visual Analytics
Be first to insight and first to action

Inline Data Wrangling
Immerse yourself in data to see what’s important

Analytics Apps at Scale
Build and broadcast smart analytics

Streaming Analytics
Gain continuous algorithmic awareness and automation
Spotfire Update

Data Connectors
- SAP HANA, OSI-PI, Spark, ...

Data Wrangling
- Data Panel Updates
- Quick click split, unpivot, ..
- Source View

Charts
- Waterfall, KPI, responsive design

Maps
- TMS, Radius, Context Auto-Zoom

Collaboration
- Annotation, Conversation

Displays
- Mobile
- Split Screen
- API for web deployment

Administration
- Scale-out Topology
- Smart routing
Spotfire Update

Smart Dashboard

Data Wrangling

Charts

Charts

Maps : Radius

Maps : TMS

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Production Overview

Total Producing Wells: 28,837
Total Operators: 25
Total Gas: 138M
Total Water: 7M

Production of Gas per Operator:
- Exco: 18.2M
- Encana: 16.9M
- Chesapeake: 16.5M
- BHP: 14.6M
- Shell: 12.3M
- Exxonmobil: 9.0M
- En Enerie: 8.7M

Gas and Water Production:
- Gas production over time for different operators.
- Water production over time for different operators.

Gas / Water Proportion Drill Down:
- 97.7% production is gas.

#Wells/Water/Gas per Year:
- Graph showing production per year for different categories.
Examples of Spotfire Recommendations in Action

Easy dashboard setup for business users, dramatically faster creation of full-featured data analysis applications for analysts

TIME IS OF THE ESSENCE

"With a dashboard, every unnecessary piece of information results in time wasted trying to filter out what’s important, which is anathema in a world of fast-paced decision making. Spotfire’s recommendations are a time-saver in the essence."

This agile business intelligence market is growing rapidly, and as Gartner points out, the transition is toward platforms that can be readily implemented and used by analysts and business users to find insights quickly—as well as by IT staff to quickly build analytics content to meet business requirements and deliver more timely business benefits. This drive for speed is about business value: accuracy and speed of interpretation for decision-making, authoring, and development of data discovery applications, and task completion to enable developers to implement their ideas quickly and obtain accurate insights.

This paper describes a recommendation engine for the TIBCO Spotfire® interactive graphical analysis system. Spotfire Recommendations makes data discovery fast and easy for both analysts and business users. The system uses metadata typing and built-in graphics taxonomy to produce a collection of inherently sensible graphics choices applied to the data at hand. The user chooses from the suggestions, and the software builds a dashboard of linked, brushable, configurable graphics with supporting data filters and graphics controls that can be rapidly applied to the canvas.


**Spotfire In-Line Data Wrangling**

<table>
<thead>
<tr>
<th>Clean bad data...</th>
<th>Handle Missing Values...</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="data.png" alt="Image" /></td>
<td><img src="missing_data.png" alt="Image" /></td>
</tr>
</tbody>
</table>

- **Quick Data Profiling**
- **Data Properties:** Descriptive Stats
- **Data Type Control**
- **Sort Order Control**
- **Missing Data Handling**
Spotfire In-Line Data Wrangling

**Enrich – Split, Create New Columns**

**Group – Clean and organize (MDM)**

[Diagram showing data wrangling features]
Spotfire Data Wrangling - Source View

- D131-06 Add Rows start
- Added rows
- Added columns
- D131-06 Add Rows start
- D131-07 new Rows (Worksheet 3rd run_2...)
- Clipboard (Worksheet Sheet)

Informations:
- Matching behavior
- Matched columns
- Ignored columns
- Join method
- Treat empty values as equal

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Spotfire Charts - Waterfall

Standard Waterfall
Evaluate how positive and negative values contribute to a final result

Waterfall with Subtotal

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Sales</td>
<td>$1020</td>
</tr>
<tr>
<td>Furniture diff</td>
<td>$120</td>
</tr>
<tr>
<td>Lamps diff</td>
<td>$110</td>
</tr>
<tr>
<td>Wallpaper d...</td>
<td>$123</td>
</tr>
<tr>
<td>2015 Sales</td>
<td>$1123</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Unit</th>
<th>Category</th>
<th>Date</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machines</td>
<td>Sales</td>
<td>12/31/2014</td>
<td>350</td>
</tr>
<tr>
<td>Consumables</td>
<td>Sales</td>
<td>12/31/2014</td>
<td>123</td>
</tr>
<tr>
<td>Professional Services</td>
<td>Sales</td>
<td>12/31/2014</td>
<td>200</td>
</tr>
<tr>
<td>Machines</td>
<td>COGS</td>
<td>12/31/2014</td>
<td>-123</td>
</tr>
</tbody>
</table>
Spotfire Charts - KPI

Production Dashboard

Operators Summary

- A&K Prod Of Texas: 0 Total Gas
- Anadarko: 7M Total Gas
- Beusa: 1M Total Gas
- BHP: 15M Total Gas
- BP: 234k Total Gas
- Brammer Engg: 14k Total Gas
- Buffco: 51k Total Gas
- Cabot: 27k
- Chaparral: 664

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Enhanced Map Charts

**Radius**
- Simple capture within distance
- Distance calculated correctly for projection!

**Contextual Auto Zoom**
- Contextual to filters
Map Charts - TMS

**Tile Mapping Service**
- Rapid rendering as tiles
- More backgrounds available e.g. topography
- Supplement to WMS
Mobile – Responsive Design

Responsive Design
- Responsive to real estate
- Laptop, Tablet, Phone

Deployment Kit
- White label apps
Spotfire Data Connectors

Amazon Redshift
Apache Spark SQL (Databricks Cloud, Apache Hadoop, Cloudera, Hortonworks, IBM BigInsights, MapR)
Cloudera Hive
Cloudera Impala
Cisco Information Server
Google Analytics (inc Business Author)
Hortonworks (Apache Hive, BigInsights Hive, MapR Hive)
HP Vertica
IBM DB2
IBM Netezza
Microsoft SQL Server
Microsoft SQL Server Analysis Services

OData
Oracle
Oracle Essbase
Oracle MySQL
OSI PI
Pivotal Greenplum
Pivotal HAWQ
PostgreSQL
Salesforce.com (inc Spotfire Business Author)
SAP HANA
SAP BW (NetWeaver Business Warehouse)
Teradata
Teradata Aster
TIBCO : OpenSpirit, AS, LDM, ...
Spotfire Data Connectors

Databricks Certified Application

Hortonworks

SAP® Certified Integration with SAP HANA®

Apache Spark™

MapR

OSIsoft®

Cloudera

TIBCO Spotfire® Data Access

Last updated: 11:56am Aug 06, 2016

Table of Contents
TIBCO Spotfire® self-service access data sources
Spotfire JDBC data sources (Information Services / Designer)
Spotfire ODBC data sources
OLAP data sources
Apache Cassandra and MongoDB
MapR Drill
Microsoft SharePoint and OData
CI/SOFT PI System
SAP Business Objects Universe
Read and write Spotfire data extracts, SBOF files

TIBCO Spotfire® self-service access data sources

Self-service data connectors allow Spotfire users to easily connect to and analyze data from relational databases, cubes, OData sources, and Hadoop.

Most data connectors need a corresponding ODBC or ADO .Net driver. If no driver has been installed you will see that the Connector is greyed out in the Add Data Tables list in Spotfire Analyst.

- Download database drivers
- TIBCO Spotfire Connectors documentation (security, functions, data types, connection methods)
- TIBCO Spotfire Connectors (installation manual, release notes)
- TIBCO Spotfire Connectors system requirements (data sources, driver versions, mapping between connectors and Spotfire versions)
- How to connect to Google Analytics with Spotfire – Wiki page with YouTube video and detailed instructions
**Spotfire Stack / 7.5+ Topology**

**Client Tier**
- Spotfire Analyst
- Spotfire Consumer & Business Author
- iOS

**Security and Routing Tier**
- Load Balancer

**Worker Service Tier**
- 4X Spotfire Web Player Servers Virtual Machines 8 CPUs, 48 GB
- 2X Spotfire Servers Virtual Machines 8 CPUs, 16 GB
- 2X Spotfire Automation Services Servers Virtual Machines 8 CPUs, 16 GB

**Data Tier**
- Corporate LDAP
- Spotfire Library and Audit Database
- Data Sources