



Building Business Intelligence in Pipeline Operations

Presented by Christine Frazier-Hollins

Agenda

Introduction

Business Challenge

Advanced Analytics Toolbox

Development

Solutions

Business Impact

Lessons Learned



Building Business Intelligence in Pipeline Operations



Human Energy®

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OSIsoft Users Conference
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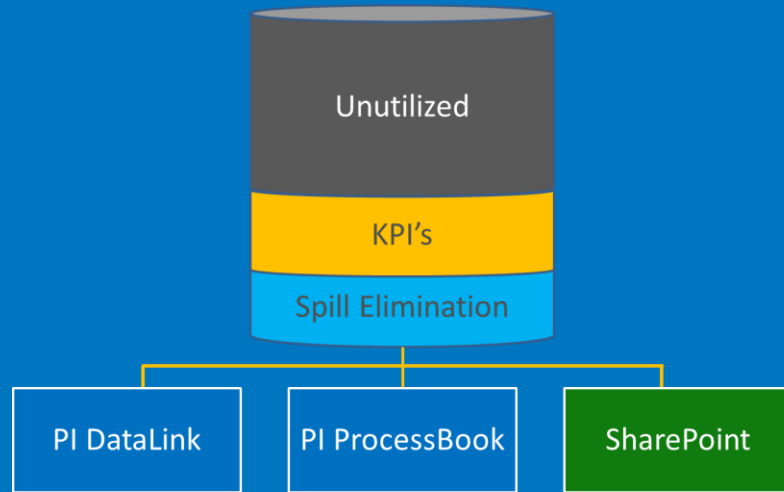
About Chevron Pipe Line Company

Chevron Pipe Line Company, headquartered in Houston, Texas, is an indirect wholly owned subsidiary of Chevron Corporation.

Operates pipeline assets that transport crude oil, refined petroleum products, liquefied petroleum gas, natural gas and chemicals within the United States.

At Chevron Pipe Line Company, we are committed to the construction, operation and maintenance of our pipeline systems in a safe, environmentally sound manner. Safety is always a top priority in any activity we undertake.

The Business Intelligence Challenge at Chevron Pipe Line Company



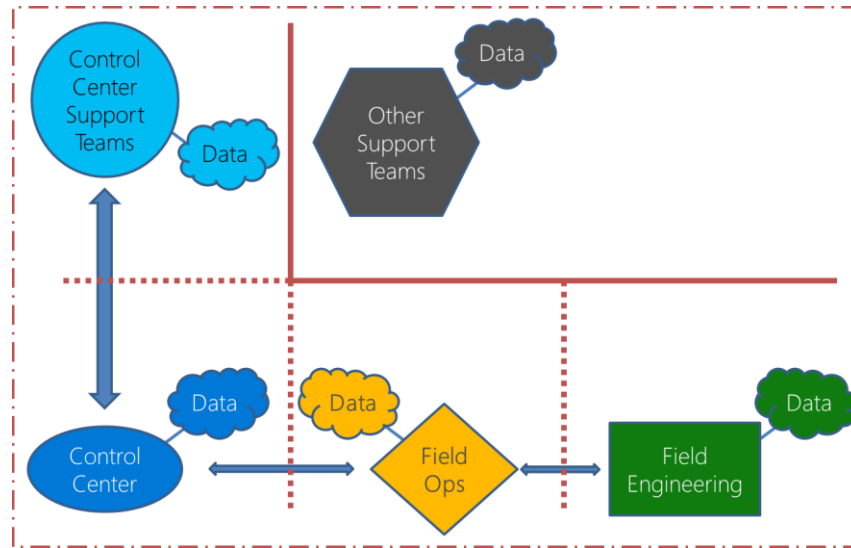
How data was used at
Chevron Pipe Line Company
(Initial State)

- PI System Enterprise Agreement
 - Key Tools used:
 - PI ProcessBook
 - PI DataLink
- Challenges:
 - SCADA - primary source of data
 - Tool usage – narrow scope
 - Dependent on power users for information
- Need to transform raw data into meaningful and useful information for the purpose of analysis

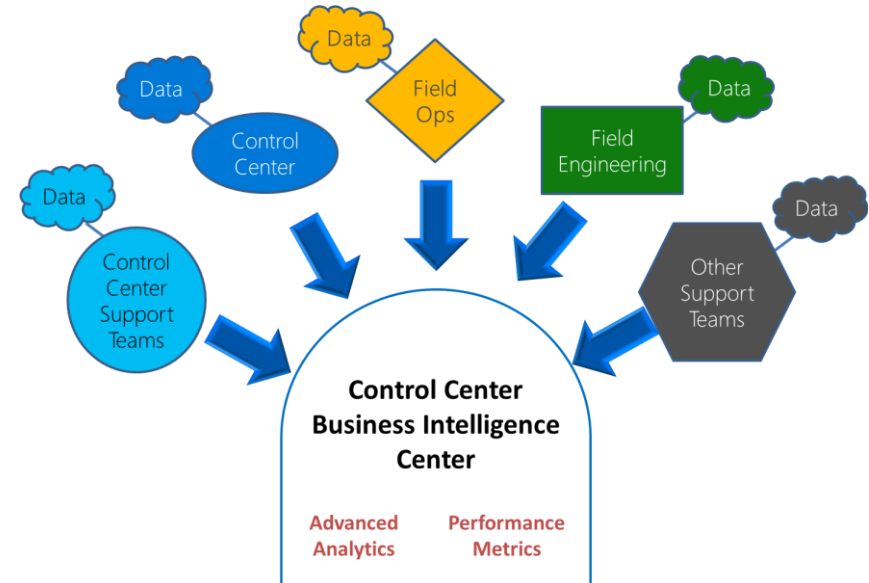
The Challenge



Initial State



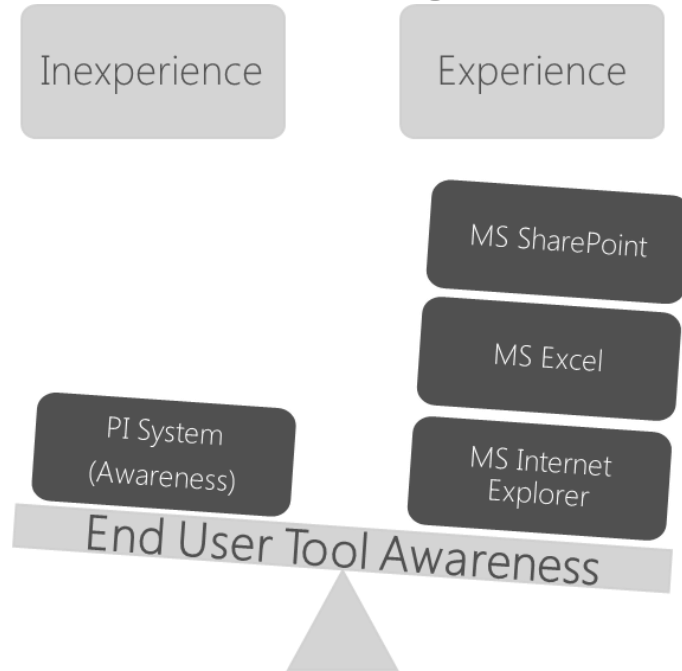
Future State



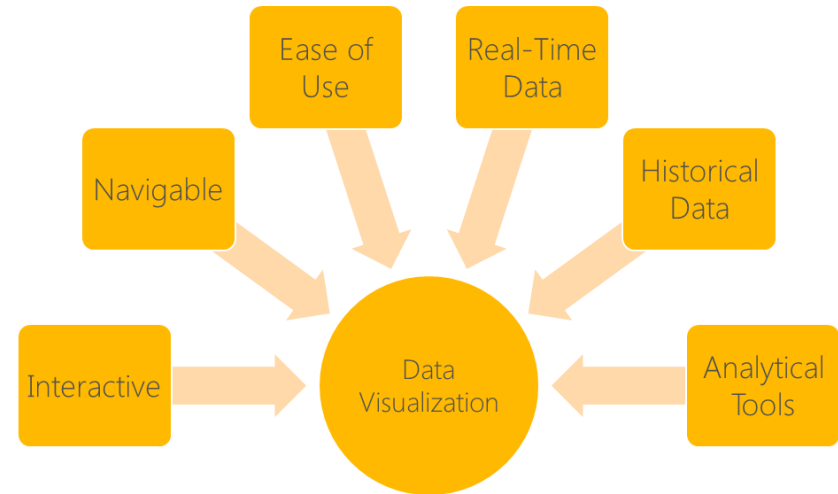
The Challenge



User Knowledge Base



Visualization Requirements



The Advanced Analytics Toolbox

Advanced Analytics Toolbox

Business Drivers and Impact



The Dashboard Desire

- “an easy to read, single page, real-time user interface, showing a graphical presentation of the current status (snapshot) and historical trends of an organization’s key performance indicators to enable instantaneous and informed decisions to be made at a glance.”

Operational Data Console Solution

- Real-time tiered **visualization** customized for a broad user base
- Built in **analytic tools** for proactive system monitoring, evaluating bottlenecks, and cost reduction opportunities
- Spill Elimination **performance** and **sensitivity evaluations**
- Data **trending/exporting** capability

Advanced Analytics Toolbox Development



Tools Available	Why not Chosen
PI DataLink	<ul style="list-style-type: none">• Pros: Works with Excel; Data Manipulation• Cons: Infrequent use and unfamiliar to target audience
PI ProcessBook	<ul style="list-style-type: none">• Pros: Display capability; Programmability; Playback functionality• Cons: Aesthetics; Greater functionality desired to maximize data integration
Web Parts/SharePoint	<ul style="list-style-type: none">• Pros: Familiar environment• Cons: Managing user access control; resolution; limited interactivity

- Hybrid self contained solution
 - Leverage MS Visual Studio
 - Windows Presentation Foundation (WPF) application with browser-type navigation
 - XAML platform with .NET managed code
 - Leverage PI System
 - Asset Framework (AF)
 - AF SDK
 - Benefits
 - Ability to build in standard analysis tools for application across multiple data sets
 - Accessible
 - Automatic Updates
 - Intuitive Navigation and Manipulation for casual users

Advanced Analytics Toolbox Implementation

SCADA DB



SCADA
Tables

- Analog
- Status
- Batmtr
- Remote
 - Rate
- Facilities



MS SQL
Current
Real-Time DB
Snapshot



MS SQL
Training
DB

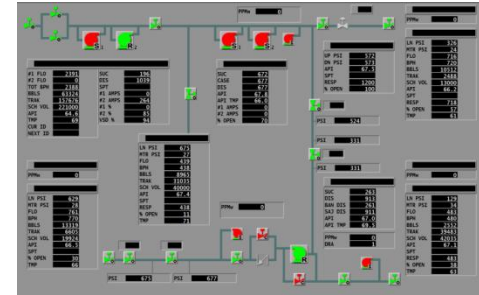


OSIsoft PI System

- History playback
- Real-time



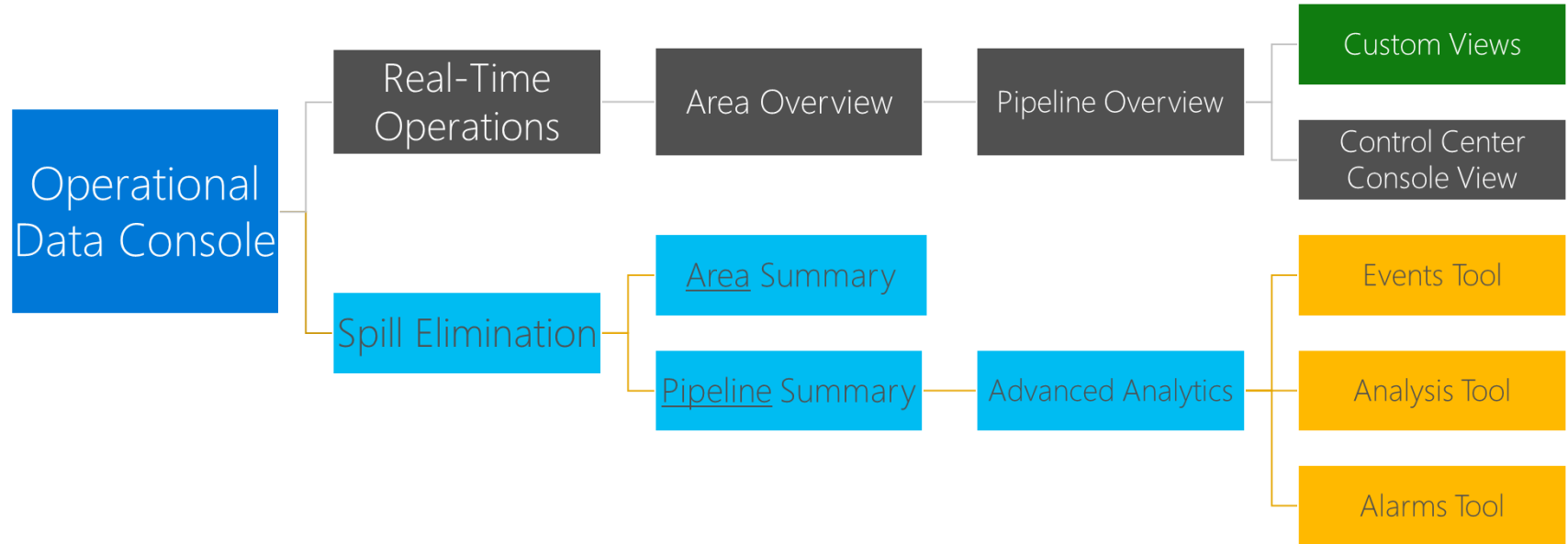
WPF/XAML



Model feed (hydraulic or functional)

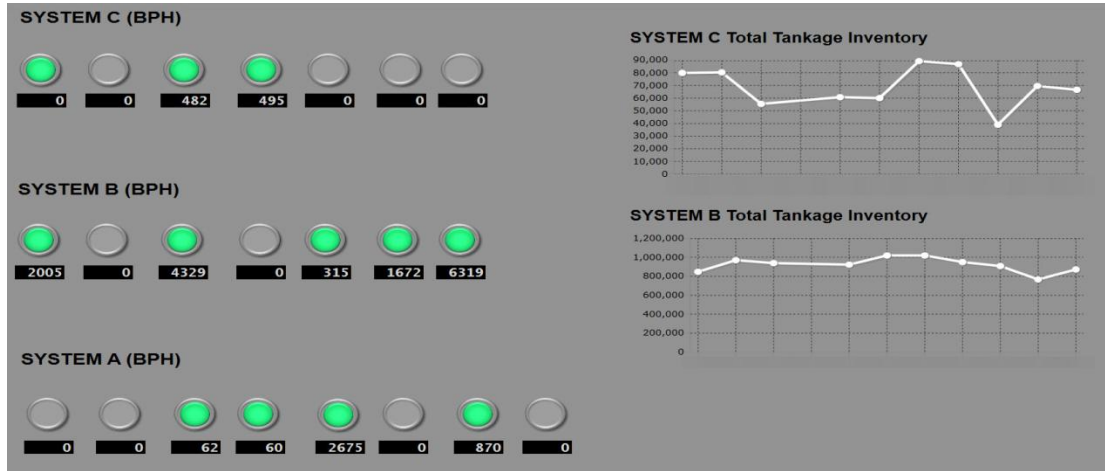
Advanced Analytics Toolbox

Visualization Track



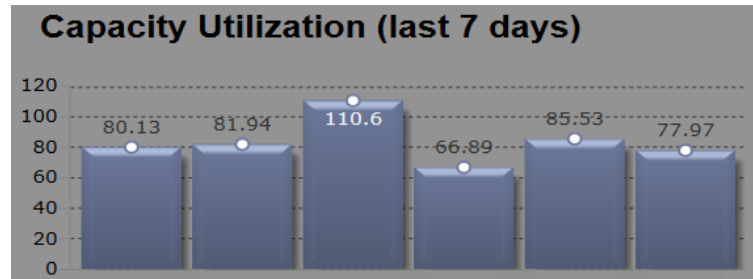
Operational Data Console Sample

Real-time Visualization: High Level



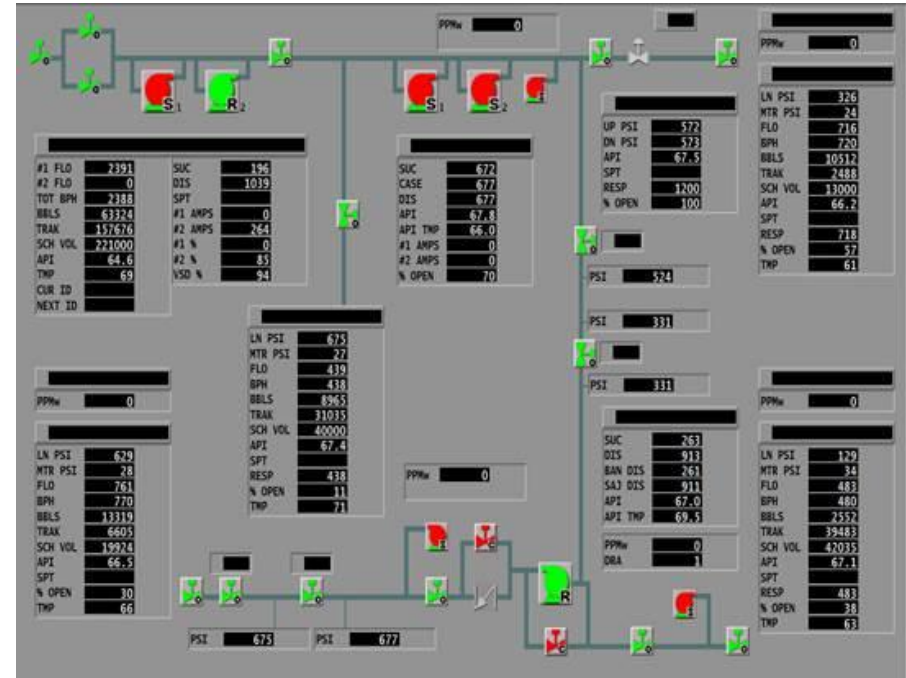
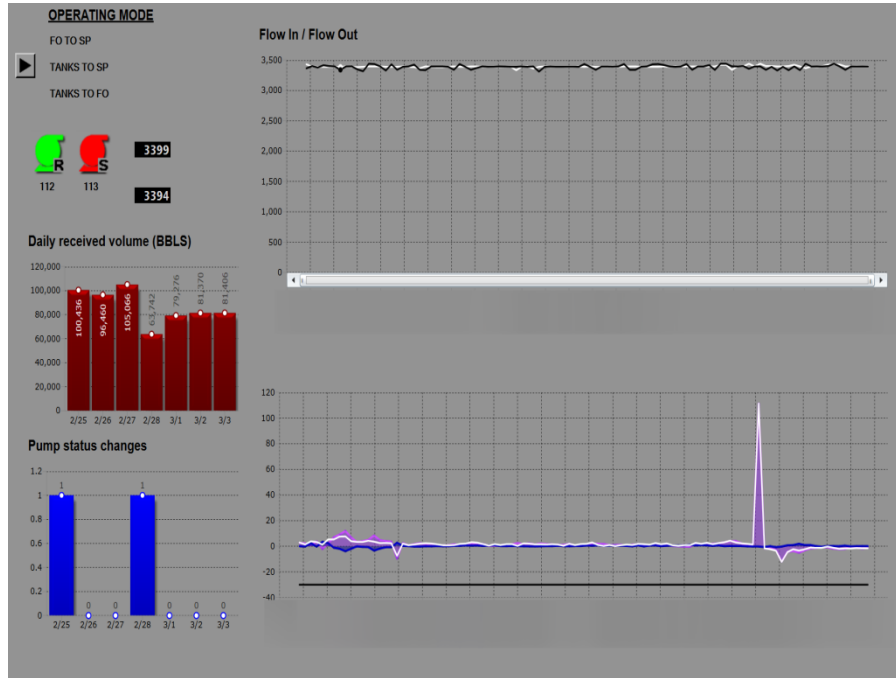
Direct trending and exporting
of all PI Points

Custom KPI's



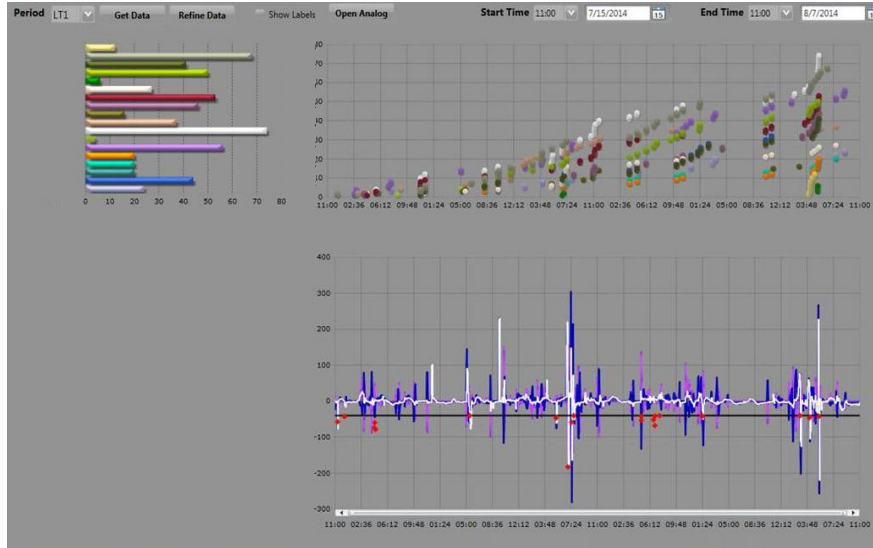
Operational Data Console Sample

Real-time Visualization: In-Depth

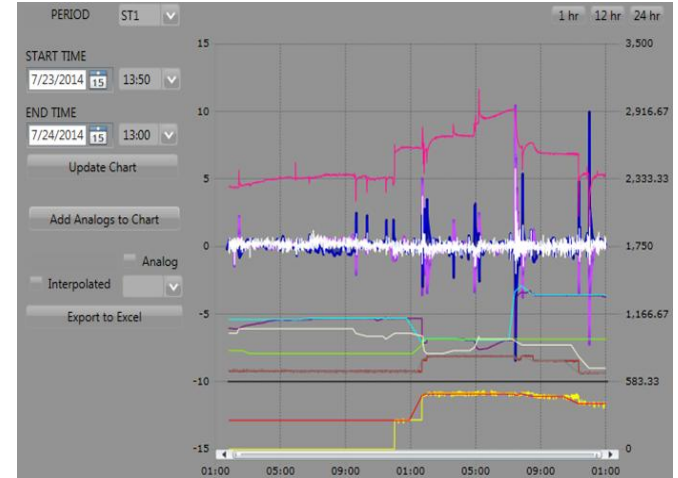


Operational Data Console Sample Built-In Advanced Analytics Tools

Events Analysis Tool

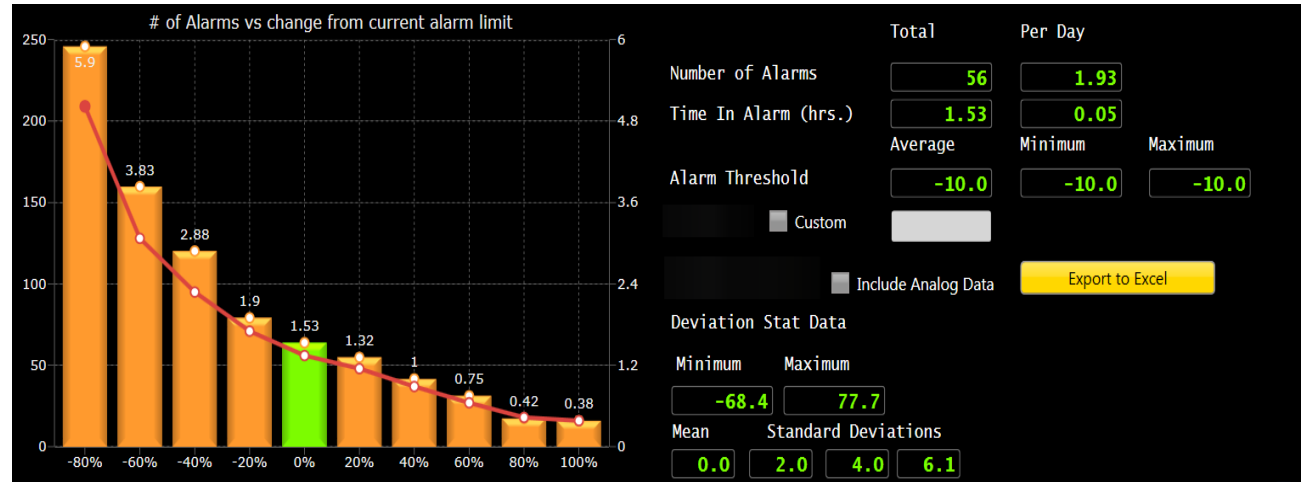
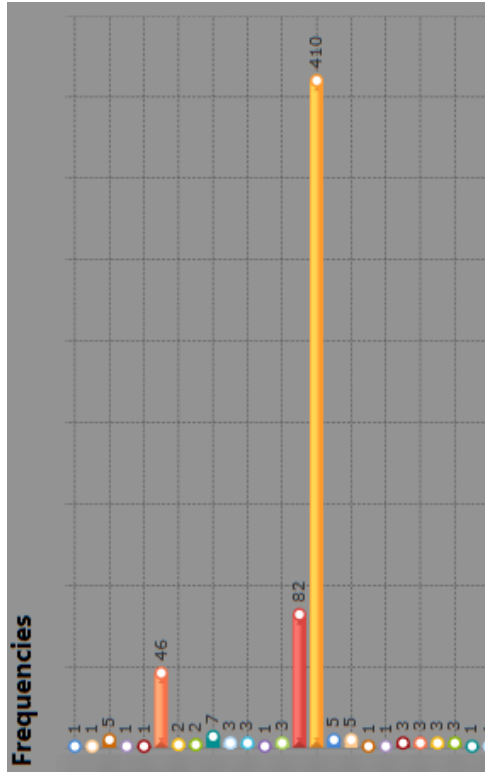


Analog Analysis Tool



Operational Data Console Sample

Actionable Intelligence in Alarming



Advanced Analytics Toolbox Data Integration Solution

Field Data

- Calibration and Proving
- Maintenance and Repairs
- Product Quality
- Inventory

Spill Elimination

- Sensitivity Improvements
- Alarm Limits Optimization
- Performance metrics
- Compliance Audit

Alarm Management

- Alarm Audits
- Reports
- Alarm Analysis
- Cause and Effect Analysis

Operations AF



Business AF

Advanced Analytics

- Spill Elimination analysis
- Operations and equipment optimization
- History playback
- Event/Incident analysis
- Predictive analysis
- Diagnostics

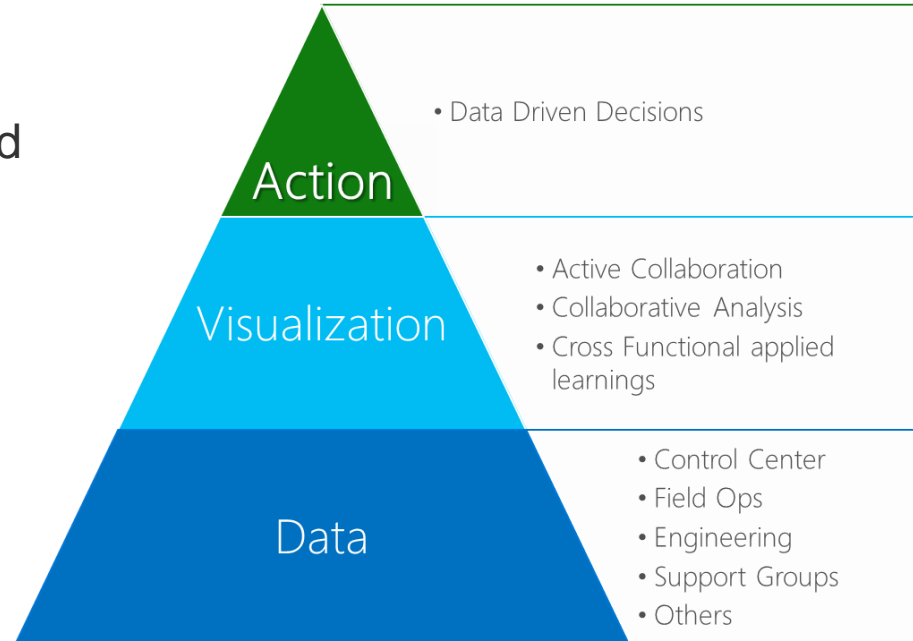
CC SharePoint Business Intelligence Center



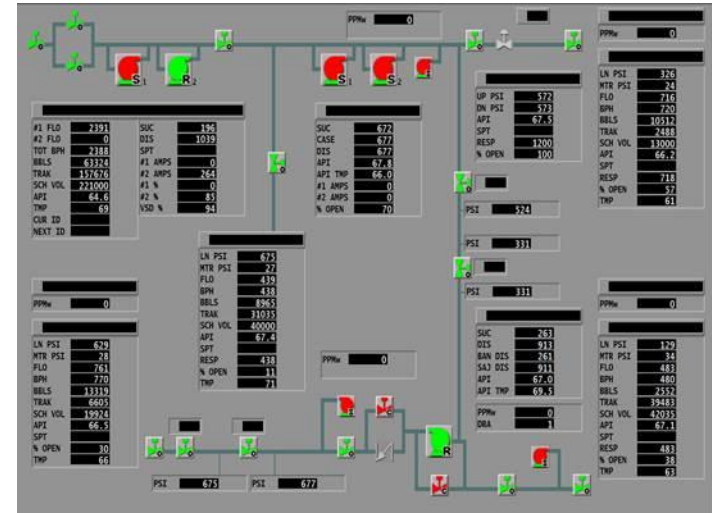
Lessons Learned in Improving Business Intelligence



- Sharing Information = Improved Communication
- Reduction of gap between data and information
- Development of enhanced leading metrics, failure predictions, and preventative measures
- Driving data utilization
- Closing the gap between “I think” and “I know”



Chevron Pipe Line Company: Building Business Intelligence in Pipeline Operations



Business Challenges

- A. Transform raw data into meaningful and actionable information
- B. Effective sharing of information across multiple functional groups and varying levels of tool competency amongst users

Solution(s)

- A. Leverage PI System (AF, SDK) and Microsoft components to create a set of multifunctional analytical tools for a broad user base.
- B. Utilizing PI AF structure to drive Business Intelligence Transformation.

Results and Benefits

- Closing the gap between “I Think” and “I Know”
- Driving up data utilization in decision making.
- Sharing information = Improved communication

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Questions

Please wait for the **microphone**
before asking your questions

State your
name & company





THANK YOU

