

Features and Architecture Overview

E&P Data Visualization Workflows Supported

G&G		Drilling		
Visualize and interact with Seismic and Well data (seismic volume, horizons, faults and well log, well trajectories and tops)	Map Search & filter of G&G data and visualize Wells, Seismics documents and other G&G data into predefined dashboards	Monitor real-time drilling data by streaming from WITSML server (1.3.1, 1.4.1)	Connect and visualize 3rd party scientific drilling engines with Well Data (drilling string mechanics, torque and drag, vibration motors...)	Display BHA data and schematics from external database (Peloton, WITSML...)
Visualize multi-well tops correlation	Support for ArcGIS layers and features	Geosteering workflow	Display directional data (actual versus planned trajectories)	Monitor NPT (Non Productive Time) and rig activity
Web portal to access and visualize geo-referenced G&G data	User-based workflow integration for processing and Machine Learning	Combine seismic and well data views		Support for WITSML 2.0 (for historical data)
Support for dynamic range intervals	Support for Shapefiles and GeoTIFF files			

Wireline	Completion	Production		
Conduct Quality Control (QC) on log data	Run casing monitoring	Monitor multiple individual well parameters connecting to external production data servers (OSIsoft server)	Display and monitor sensors, captors and equipment data from SCADA systems	Control real-time opening and closing valves
Visualize formation evaluation	Display well schematics—plan vs. actual		Provide alarm messages for abnormal conditions	Decline curve analysis
Combine displays log data, directional, lithologies, formation tops	Display perforation intervals			Visualize break-even point
Monitor in real-time wireline data				Automated reporting capabilities

Interactive Visualization

Generic	Navigation Features	Dashboard Page			
Responsive web design interface	Show/hide data tree	Data Tree	Visualization Area	Toolbar	
Interactive docking framework (dashboard organization by users)	Dark UI mode	Data tree access to Project data, dashboards and templates	Organize chart widgets using the docking framework	Quick access to widget functionalities	
Interactive visualization manipulation (pointing, clicking, selecting, dragging, dropping)	Favorites, Recents, Home, Dashboard pages	Quick access to project content	Custom widget grouping	Quick access to object properties	
Touch screen support	Right side menu to access State definition, formula editing, themes and publishing	Collapse data tree	Add a new row of widgets	Quick access to tools	
Visual/gestural manipulations: multitouch operations such as pinch and zoom, rotate, and flick. 3D visualization rotation by three (x, y, z) axes.	Home Page	Manage and share dashboards	Full screen widget	Quick access to data filtering	
Dashboard and Template system with sharing capability	Home page Map Centric, Well Centric, or Dashboard Centric	Manage and share templates	Move widget	Quick access to shortcut	
Capability to publish a dashboard and share it with other users	Shared dashboards with users or groups	Group data sets by categories	Split area horizontally or vertically	Quick access to processor	
	Search, list of dashboards	Shows widget type as title after widget creation	Display metadata into widget title	Dashboard name visible into the navigation bar	
	Dashboard menu options available from thumbnail and dashboard list NEW	Set interval for data requests	Tooltip displayed on active widget only		
	Thumbnails of most recent dashboards and dashboard templates	Access to metadata information (for well metadata)	Notification dialog for errors, warnings, and process status		
	Access to most recent projects from Home page	Support floating toolbar in publish mode	Theme manage globally or locally inside a widget		
	Map page accessible from the navigation bar with search and filtering options	Project content updated automatically	Export dashboards as PNG		
	Create and update projects using maps	Delete top and top set from data tree			
		Delete formula curves			
		Color well icon by group			

Types of Visualization

Report	Spectrum	Drilling Status	Value Tracker	Histogram	Well Section
Display report template	Analyze seismic data spectrum	Display real-time BHA position	View log curve value	Analyze seismic data distribution	Display vertical fence along a well trajectory in TVDSS versus Measured Depth
Support for tables and metadata	Compare multiple parts of data in one chart	Zoom in and out	Support multi-datasets	Support frequency types: absolute, normalized, relative	Option for project ahead trajectory display
Custom created reporting dashboard	Support both time domain and depth domain data	Select among pre-defined BHAs	Support and follow real-time updates	Export to PDF	Display seismic background
Image Widget	Switch between analysis modes: Amplitude, dB Linear, Phase, Wrapped Phase, Power	Title Widget	Support for state definition	Curve dictionary and Curve aliases support	Display well log template
Display PNG, JPEG and TIFF files	Apply Filtering / Windowing / Smoothing / Phase Trend Removal processors	Display data set name	Curve dictionary and Curve aliases support	Support for State definition	Display well tops
		Display real-time status			
		Option for free text			
		Support for metadata keywords			

Features and Architecture Overview

Types of Visualization

Well log	3D View	2D Seismic	Schematics	Diagram Widget	
<ul style="list-style-type: none"> Support for Single Data, Multi-Data, Multi-Parent mode Time or Depth indexed data View log curve / array curve / discrete curve Array log vertical interpolation State definition support for annotation curve Display log curve line / symbol / value with micro-positioning Display log fill between curves / track borders / base lines with gradient Display lithologies Display annotations Display stacked curves Display tops Display schematics Display perforations Display casing Display Open Hole section Display interval curve Display raster files Display stacked pattern curves Converts curve to logarithmic automatically when adding to a logarithmic track in WellLog widget Combined display (log, mudlog, trajector, schematics, images) synchronized while switching well Real-time mud log Switch main index Follow real-time updates Support real-time updates with ascending or descending depth index Support multi-datasets Support vertical / horizontal orientation Curve editing Top editing Annotation curve editing Lithology editing Support for tadpole Support state definition for symbol color filling Manage order in curves displayed in track Shortcut to favorite templates Curve dictionary and Curve aliases support Autofit to quickly scan multiple wells Scale visible in the header of index track (optional) Scroll bar position save/restore WellLog widget header (PDF printing) Export to PDF with interval settings Support for footer Curve value tooltip at cursor position Filter objects displayed into the tracks Display line color using state definition 	<ul style="list-style-type: none"> Change order of the objects displayed into a track Support Cutoff mode Support multiple index with different unit Drag & Drop a log display all curves Support for dynamic range interval 	<ul style="list-style-type: none"> Display 2D seismic, inline, crossline, time slice, arbitrary line Display multiple inlines, crosslines and time/depth slices Display surface map Display horizons Display faults and fault sets Display reservoir grid and properties Support state definition on reservoir data Display wellhead Display well tops Display correlation fence Display trajectory fence Display trajectory line Display trajectory tube Display survey stations Display curve tube Display cylinder log Display plane log Drag & drop multiple objects from the data tree Use state definition on curve tube, cylinder log and plane log Display point set data with symbol color and size based on properties values Display intersection between inlines/crosslines and horizons, surfaces, faults, triangle mesh, reservoir Highlight selected object Apply property change to current object or all same objects Trajectory vertical elevation support 3D crosshair with projection on 2D plans Switch between free camera and follow cursor mode Synchronize cursor tracking with 2D Seismic widget Option from time slice compression Support for AGC noise reduction Support data with no CRS Seismic support for transparency Support for contour lines on horizons and gridsurfaces Support for well casing, casing shoe, tubing, perforations Synchronize well cursor with Schematic widget Synchronize cursor between seismic volume and Basemap widget Calculate reservoir volume of visible cells Reservoir properties visible into the data tree Reservoir properties to support logarithmic mode Filter reservoir on multiple properties Seismic support for ZFP compression 	<ul style="list-style-type: none"> Display inline, crossline, horizons Quick access tool bar for inline and crossline selection and navigation View SEG-Y / SU / SEP / JavaSeis / ProMAX / SEG2 / SEG2 / OpenVDS Support seismic compression Navigate seismic survey Display wiggles Display variable and interpolated density Display positive and negative fill with solid color or gradient Reverse polarity option Reverse gradient option Display gaps in seismic profile Display EBCDIC information Binary/EBCDIC copy to clipboard NEW VDS 2D dataset support NEW Header information dialog Apply Filter / AGC / Reverse processors Fault display support Fault editing Create Fault set Support for overlay display Support for ZFP compression Support different scales between inline, crossline, slice 	<ul style="list-style-type: none"> Display schematic data Support for casing, tubing and BHA Animated BHA (fluid, debris...) Support for perforations Cursor tracking with WellLog Display Open Hole section Display deviated schematics Tracking with 3D widget Tabular version display in table widget 	<ul style="list-style-type: none"> Display SVG file Support for simple animations Support display curve values updated with cursor position or real-time Support for state definition Support for dynamic binding Support for tabular data
	<ul style="list-style-type: none"> Correlation Display Add/remove wells and wellbores Apply well log template Zoom in/out individually or all wells Scroll up/down individually or all wells Reset well position Synchronize spacing between wells Apply well log template Horizontal scale Add/remove tops Top editing Save tops to database Raster log support Supports horizontal scales Switch raster log Switch log Curve dictionary and curve aliases support Create correlation fence from Correlation widget and edit in Map widget Interval name in top state definition Shortcut to favorite templates Ghost curve support Flatten on top Flatten on index value Align Wells to top or bottom measure depth Definition for colors and pattern created from displayed tops Print to PDF Switchindex between MD, TVD, TVDSS Support Top unconformity Display well group in well header Support for proportional distances between wells 				
			<ul style="list-style-type: none"> Statistic Support multi-datasets Curve dictionary and Curve aliases support Support for Dynamic Range intervals 		
			<ul style="list-style-type: none"> HTML iframe support Time or Depth indexed data Support switching between well and wellbore 		
			<ul style="list-style-type: none"> Gauge Support for real-time updates Support for visual alarms Gauge type Tracking NEW Gauge type Tracking Bar Gauge type Digital Gauge type Full Circular Gauge type Half Circular Gauge type Quarter Circular Gauge type Multiple Tracking Gauge type Vertical / Horizontal Bar Gauge type Real-time gauge used to display activity status Curve dictionary and Curve aliases support 		
			<ul style="list-style-type: none"> Line Chart Lock on name for tabular data NEW Range support for tabular data NEW Cursor tracking XY line chart with option for markers display Support for multiple data series Display mode for Single Data, Multi-Data or Multi-Parent Support for multiple axis Support for annotations Curve dictionary and Curve aliases support Multi-data set and multi-parent support for logs Option for tracking along wellpath in 3D View widget Ability to move annotations Manage display order of data series 		
				<ul style="list-style-type: none"> Table View View log curve Support multi-datasets Follow real-time updates Support for state definition Lock on name NEW Create State definition from the widget NEW Customize column (filter, align) NEW Support for header wrapping Support for column sorting Ability to hide Title NEW Fit Column to the width of the widget NEW Improve template saving NEW Supports formatting for each column Display top set table Support cell wrapping Optimized default column width Pivot Table Display pivot table Calculate statistics Aggregate table data Spreadsheet Table Display table data Support multiple spreadsheets Curve dictionary and Curve aliases support Display Shapefile and GeoTIFF in tabular form Drag and drop a log displays all curves Support for Lock on Type Support for duplicated curve names Support search for specific depth index Ability to search for curve values Ability edit curve value Ability to delete multiple rows of a log 	

Features and Architecture Overview

Types of Visualization

Scatter Plot/ Cross-Plot	Time Series Chart	Bar Chart	Basemap	Pie Chart
<ul style="list-style-type: none"> Support third dimension using gradient color or state definition Curve dictionary and Curve aliases support Support for regression line linear and non-linear Cross-hair in color bar State definition support Filtering content based on state definition Discrete editing Export to PDF Highlighting based on basemap polygon Support for interval data as Z axis Support for horizon attributes Support for Dynamic Range intervals 	<ul style="list-style-type: none"> Support for Single Data, Multi-Data, Multi-Parent mode Display one or multiple time series Support for color filling between series Support for state definition Support for real-time Support for table data Support for Annotations Support for Perforations Support for logarithmic mode Drag & drop log displays all curves Change display order of data series 	<ul style="list-style-type: none"> Range support for tabular data Lock on name for tabular data Accumulation mode Display discrete curve Line display option with show / hide markers Support for continuous curve with state definition Support for table data Support for real-time update Support for Dynamic Range intervals 	<ul style="list-style-type: none"> Display seismic slices, inline, cross-lines Display horizons, gridsurfaces, triangle mesh, faults Display reservoir layer Display well locations, well trajectories Drag & drop multiple objects from the data tree Support for contours Support for transparency Export to PDF Support for Shapfiles Support for GeoTIFF Seismic support for ZFP compression 	<ul style="list-style-type: none"> Support for tabular data NEW Lock on name for tabular data NEW Multi series support for tabular data NEW Cursor tracking for tabular data NEW Display discrete curve Support continuous curve with state definition Support for real-time update Support for Dynamic Range intervals

Platform

<ul style="list-style-type: none"> HTML5 (JavaScript) based client SDK based workflow integration for Machine Learning Cross-platform desktop, tablet, mobile support Cross-browser IE11+ / Chrome / Firefox / Safari / Mobile Safari 	<ul style="list-style-type: none"> White label / branding support Help system Highly scalable Micro-services architecture Real-time support / acquisition live status determination / near real-time (1s) 	<ul style="list-style-type: none"> Math engine / expression based math solver, statistical functions Plug-in support for customer processes Software development kit (SDK) for custom connectors Software development kit (SDK) for frontend developments 	<ul style="list-style-type: none"> Data Versioning Annotations Support for global mnemonics, aliases, units of measure and conversion Use of Apache SIS for CRS transformations Resilient and fault-tolerant Importer/loader for Excel and CSV file 	<ul style="list-style-type: none"> Extensibility (add contextual menus, launch scripts, create own plugins and workflows, public Java API...), embeddability Support for Seismic indexing for Azure Blob Storage seismic (and soon AWS S3) Support of OSDU M8 Support for OpenEarth 	<ul style="list-style-type: none"> Support for MinIO and Cloudian storages
---	--	---	---	---	---

Data Management

Objects Supported	File Formats Supported (Extensible)	Connectors
<ul style="list-style-type: none"> Static and real-time data Well log curve (single and multi-value) Well tops Well Lithology and Annotation Well documents BHA, Schematics, Completion, Casing, Perforations (SVG, CAD) Seismic inline, crossline, time slice Seismic geometry: Prestack, volume, 2D lines 	<ul style="list-style-type: none"> Horizons, Faults Grid surfaces Reservoir grids Point Set Time series data, OSISOft tag Table, SQL queries WITSML 1.3.1 and 1.4.1 objects (Well, Wellbore, ChangeLog, Log, Message, MudLog, Risk, Trajectory, Tubular, WbGeometry) 	<ul style="list-style-type: none"> Seismic: SEG-Y, SEG-D, SEG-2, INT Indexed XGY, SU, INT Indexed SU, SEP, OpenVDS, JavaSeis, Promax, Indexed Promax, CST, Indexed CST Grid Surface: Open Works, Petrel, Global Mapper, ASCII R5000/ OSDU, GeoCraft, Kingdom Horizon, XYT Horizon: IXTA, INT XML Horizon, ASCII R5000/ OSDU Fault: INT ASCII Fault, ASCII OSDU, Petrel ASC, Kingdom Fault
	<ul style="list-style-type: none"> Point Set: INT ASCII PointSet, INT XML PointSet Reservoir: RESQML, Eclipse ASCII Grid Triangle Mesh: GOCAD/ TSURF, XYZ, Petrel DAT Cultural Data: PNG, JPG, GIF, SVG, TIFF Tops: ASCII Well Data: LAS 2.0, LAS 3.0, DLIS, ASCII Well Survey: ASCII Well Document: PDF Diagram: SVG 	<ul style="list-style-type: none"> MongoDB NoSQL OpenEarth INTGeoServer INT Geofiles SQL Peloton WITSML (data streaming directly into WITSML server) OSISOft Relational Query Access PPDM
		<ul style="list-style-type: none"> ArcGIS Amazon AWS S3 Microsoft Azure Blob Storage Google Cloud Data Storage EIA (US Energy Information Administration) MinIO Cloudian CosmosDB

Security/System Management

Admin	User Management/Preferences	Security
<ul style="list-style-type: none"> Import files (CVS, LAS, ASCII, WITSML) Import wellhead information Import formation tops Import new users list Import curve, curve alias, and unit dictionary Import schematics dictionary Import raster files 	<ul style="list-style-type: none"> Import JPEG, PNG and SVG files Import pointset data Import by reference for well documents, LAS, grid surfaces, point set, horizons Time zone support for CSV Server pagination for Users, Groups, Projects 	<ul style="list-style-type: none"> Added date/time services to the table Active / Deactivate users in bulk Share and copy templates to groups NEW Share state definitions and formulas Manage cloud services Seismic cloud indexer
	<ul style="list-style-type: none"> Manage domains, groups and users Manage data access permissions Manage connectors and queries Manage projects 	<ul style="list-style-type: none"> Manage dashboards and templates Manage domain resources (pattern files, audop files, templates,, map services) Manage sharing between users and groups License management
		<ul style="list-style-type: none"> Authentication (Single, Sign-on, SSL) SAML support Authorization Encryption Usage monitoring, auditing Auditing support