IVAAP™

IVAAP 2.10 Features and Architecture Overview

E&P Data Visualization Workflows Supported

G&G (Geology and Geophysical)	Drilling	Wireline	Completion	Production		
Visualize and interact with Seismic and Well data (seismic volume, horizons, faults and well log, well trajectories and tops)	Monitor real-time drilling data by streaming from WITSML server (1.3.1, 1.4.1)	Conduct Quality Control (QC) on log data	Run casing monitoring	Monitor multiple individual well parameters connecting to external production data servers (OSIsoft server)		
Visualize multi-well tops correlation	Geosteering workflow	Visualize formation evaluation	Display well schematics—plan vs. actual	Display and monitor sensors, captors and equipment data from SCADA systems		
Web portal to access and visualize geo-referenced G&G data	Combine seismic and well data views	Combine displays log data, directional, lithologies, formation tops	Display perforation intervals	Provide alarm messages for abnormal conditions		
Map Search & filter of G&G data and visualize Wells, Seismics documents and other G&G data into predefined dashboards	Connect and visualize 3rd party scientific drilling engines with Well Data (drilling string mechanics, torque and drag, vibration...)	Monitor in real-time wireline data		Control real-time opening and closing valves		
Support for ArcGIS layers and features	Display directional data (actual versus planned trajectories)			Analyze declination curves—plan vs. actual		
User-based workflow integration for processing and Machine Learning	Display BHA data and schematics from external database (Peloton, WITSML...)			Visualize break-even point		
Support for Shapefiles and GeoTIFF files	Monitor NPT (Non Productive Time) and rig activity			Automated reporting capabilities		
	Support for WITSML 2.0 (for historical data)					

Interactive Visualization

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

Types of Visualization

Well log	Well Section	Map	3D View	2D Seismic	Schematics	Report	Bar Chart
Support for Single Data, Multi-Data, Multi-Parent mode	Display vertical fence along a well trajectory in TVDSS versus Measured Depth	Support for Web Map Tile Service (WMTS): Google, Bing, OpenStreetView...	Display 2D seismic, inline, crossline, time slice, arbitrary line	Display inline, crossline, horizons	Display schematic data	Display report template	Range support for tabular data
Time or Depth indexed data	Option for project ahead trajectory display	Support for GeoJSON	Display multiple inlines, crosslines and time/depth slices	Quick access tool bar for inline and crossline selection and navigation	Support for casing, tubing and BHA	Support for tables and metadata	Lock on name for tabular data
View log curve / array curve / discrete curve	Display seismic background	Support for multiple feature layers	Display surface map	View SEG-Y / SU / SEP / JavaSeis / ProMAX / SEGD / SEG2 / OpenVDS	Animated BHA (fluid, debris...)	**Custom created reporting dashboard**	Accumulation mode
Array log vertical interpolation	Display well log template	Support for ArcGIS feature layer	Display horizons	Support seismic compression	Support for perforations		Display discrete curve
State definition support for annotation curve	Display well tops	Support for multiple ArcGIS servers	Display faults and fault sets	Navigate seismic survey	Cursor tracking with WellLog	**Table View**	Line display option with show / hide markers
Display log curve line / symbol / value with micro-positioning		Support for Bing Aerial Maps	Display reservoir grid and properties	Display wiggles	Display Open Hole section	View log curve	Support for continuous curve with state definition
Display log fill between curves / track borders / base lines with gradient	**Correlation Display**	Support for search directly through data store	Support state definition on reservoir data	Display variable and interpolated density	Display deviated schematics	Support multi-datasets	Support for table data
Display lithologies	Add/remove wells and wellbores	Display seismic lines	Display wellhead	Display positive and negative fill with solid color or gradient	Tracking with 3D widget	Follow real-time updates	Support for real-time update
Display annotations	Apply well log template	Display wellhead location	Display well tops	Reverse polarity option	Tabular version display in table widget	Support for state definition	
Display stacked curves	Zoom in/out individually or all wells	Display and edit well correlation fence	Display correlation fence	Reverse gradient option		Lock on name NEW	**Pie Chart**
Display tops	Scroll up/down individually or all wells	Select seismic line and wells	Display trajectory fence	Display gaps in seismic profile	**Time Series Chart**	Create State definition from the widget NEW	Support for tabular data NEW
Display schematics	Reset well position	Individual or area selection	Display trajectory line	Display EBCDIC information	Support for Single Data, Multi-Data, Multi-Parent mode	Customize column (filter, align) NEW	Lock on name for tabular data NEW
Display perforations	Synchronize spacing between wells	Metadata for selection object displayed on map	Display trajectory tube	Binary/EBCDIC copy to clipboard NEW	Display one or multiple time series	Support for header wrapping	Multi series support for tabular data NEW
Display casing	Apply well log template	Interactive well grouping on map	Display survey stations	VDS 2D dataset support NEW	Support for color filling between series	Support for column sorting	Cursor tracking for tabular data NEW
Display Open Hole section	Horizontal scale		Display curve tube	Header information dialog	Support for state definition	Ability to hide Title NEW	Display discrete curve
Display interval curve	Add/remove tops	**Basemap**	Display cylinder log	Apply Filter / AGC / Reverse processors	Support for real-time	Fit Column to the width of the widget NEW	Support continuous curve with state definition
Converts curve to logarithmic automatically when adding to a logarithmic track in...	Top editing	Display seismic slices, inline, cross-lines	Display plane log	Fault display support	Support for table data	Improve template saving NEW	Support for real-time update
Support for annotation curve editing	Save tops to database	Display horizons, gridsurfaces, triangle mesh, faults	Drag & drop multiple objects from the data tree	Fault editing	Support for Annotations	Supports formatting for each column	
Combined display (log, mudlog, trajector, schematics, images) synchronized while...	Raster log support	Display reservoir layer	Use state definition on curve tube, cylinder log and plane log	Create Fault set	Support for Perforations	Display top set table	**Line Chart**
Real-time mud log	Supports horizontal scales	Display well locations, well trajectories	Display point set data with symbol color and size based on properties values	Support for overlay display	Support for logarithmic mode	Support cell wrapping	Lock on name for tabular data NEW
Switch main index	Switch raster log	Drag & drop multiple objects from the data tree	Display intersection between inlines/crosslines and horizons, surfaces, faults, triangle mesh...			Optimized default column width	Range support for tabular data NEW
Follow real-time updates	Switch log	Support for contours	Highlight selected object	**HTML**	**Spectrum**	Pivot Table	Cursor tracking
Support real-time updates with ascending or descending depth index	Curve dictionary and curve aliases support	Support for transparency	Apply property change to current object or all same objects	iframe support	Analyze seismic data spectrum	Display pivot table	XY line chart with option for markers display
Support multi-datasets	Create correlation fence from Correlation widget and edit in Map widget	Export to PDF	Trajectory vertical elevation support	Time or Depth indexed data	Compare multiple parts of data in one chart	Calculate statistics	Support for multiple data series
Support vertical / horizontal orientation	Interval name in top state definition		3D crosshair with projection on 2D plans	Support switching between well and wellbore	Support both time domain and depth domain data	Aggregate table data	Display mode for Single Data, Multi-Data or Multi-Parent
Discrete editing	Shortcut to favorite templates	**Histogram**	Switch between free camera and follow cursor mode		Switch between analysis modes: Amplitude, dB Linear, Phase, Wrapped Phase, Power...	Spreadsheet Table	Support for multiple axis
Top editing	Ghost curve support	Analyze seismic data distribution	Synchronize cursor tracking with 2D Seismic widget	**Gauge**	Apply Filtering / Windowing / Smoothing / Phase Trend Removal processors	Display table data	Support for annotations
Annotation curve editing	Flatten on top	Support frequency types: absolute, normalized, relative	Option from time slice compression	Support for real-time updates		Support multiple spreadsheets	Curve dictionary and Curve aliases support
Support for tadpole	Flatten on index value	Export to PDF	Support for AGC noise reduction	Support for visual alarms	**Scatter Plot / Cross-plot**	Curve dictionary and Curve aliases support	Multi-data set and multi-parent support for logs
Support state definition for symbol color filling	Align Wells to top or bottom measure depth	Curve dictionary and Curve aliases support	Support data with no CRS	Gauge type Tracking NEW	Support third dimension using gradient color or state definition		Option for tracking along wellpath in 3D View widget
Manage order in curves displayed in track	Definition for colors and pattern created from displayed tops		Seismic support for transparency	Gauge type Tracking Bar	Curve dictionary and Curve aliases support	**Statistic**	
Shortcut to favorite templates	Print to PDF	**Diagram Widget**	Support for contour lines on horizons and gridsurfaces	Gauge type Digital	Support for regression line linear and non-linear	Support multi-datasets	**Value Tracker**

Curve dictionary and Curve aliases support		Display SVG file	Support for well casing, casing shoe, tubing, perforations	Gauge type Full Circular	Cross-hair in color bar	Curve dictionary and Curve aliases support	View log curve value
Autofit to quickly scan multiple wells	**Title Widget**	Support for simple animations	Synchronize well cursor with Schematic widget	Gauge type Half Circular	State definition support		Support multi-datasets
Scale visible in the header of index track (optional)	Display data set name	Support display curve values updated with cursor position or real-time	Synchronize cursor between seismic volume and Basemap widget	Gauge type Quarter Circular	Filtering content based on state definition	**Drilling Status**	Support and follow real-time updates
Scroll bar position save/restore	Display real-time status	Support for state definition		Gauge type Multiple Tracking	Discrete editing	Display real-time BHA position	Support for state definition
WellLog widget header (PDF printing)	Option for free text			Gauge type Vertical / Horizontal Bar	Export to PDF	Zoom in and out	Curve dictionary and Curve aliases support
Export to PDF with interval settings	Support for metadata keywords	**Image Widget**		Gauge type Real-time gauge used to display activity status		Select among pre-defined BHAs	
Support for footer		Display PNG, JPEG and TIFF files		Curve dictionary and Curve aliases support			
Curve value tooltip at cursor position							

Platform

HTML5 (JavaScript) based client	Cross-browser IE11+ / Chrome / Firefox / Safari / Mobile Safari	Highly scalable	Math engine / expression based math solver, statistical functions	Software development kit (SDK) for frontend developments	Support for global mnemonics, aliases, units of measure and conversion	Importer/loader for Excel and CSV file	Support of OSDU M8
SDK based workflow integration for Machine Learning	White label / branding support	Micro-services architecture	Plug-in support for customer processes	Data Versioning	Use of Apache SIS for CRS transformations	Extensibility (add contextual menus, launch scripts, create own plugins and workflows, public Java API...), embeddability	Support for OpenEarth
Cross-platform desktop, tablet, mobile support	Help system	Real-time support / acquisition live status determination / near real-time (1s)	Software development kit (SDK) for custom connectors	Annotations	Resilient and fault-tolerant	Support for Seismic indexing for Azure Blob Storage seismic (and soon AWS S3)	Support for MinIO and Cloudian storages

Data Management

Connectors		Objects Supported		File Formats Supported (Extensible)	
MongoDB	PPDM	Static and real-time data	Horizons, Faults	Seismic: SEG-Y, SEG-D, SEG-2, INT Indexed XGY, SU, INT Indexed SU, SEP, OpenVDS, JavaSeis, Promax, Indexed Promax, CST, Indexed CST	Cultural Data: PNG, JPG, GIF, SVG, TIFF
NoSQL	ArcGIS	Well log curve (single and multi-value)	Grid surfaces	Grid Surface: Open Works, Petrel, Global Mapper, ASCII R5000/OSDU, GeoCraft, Kingdom Horizon, XYT	Tops: ASCII
OpenEarth	Amazon AWS S3	Well tops	Reservoir grids	Horizon: IXTA, INT XML Horizon, ASCII R5000/OSDU	Well Data: LAS 2.0, LAS 3.0, DLIS, ASCII
INTGeoServer	Microsoft Azure Blob Storage	Well Lithology and Annotation	Point Set	Fault: INT ASCII Fault, ASCII OSDU, Petrel ASC, Kingdom Fault	Well Survey: ASCII
INT Geofiles	Google Cloud Data Storage	Well documents	Time series data, OSIsoft tag	Point Set: INT ASCII PointSet, INT XML PointSet	Well Document: PDF
SQL	EIA (US Energy Information Administration)	BHA, Schematics, Completion, Casing, Perforations (SVG, CAD)	Table, SQL queries	Reservoir: RESQML, Eclipse ASCII Grid	Diagram: SVG
Peloton	MinIO	Seismic inline, crossline, time slice	WITSML 1.3.1 and 1.4.1 objects (Well, Wellbore, ChangeLog, Log, Message, MudLog, Risk, Trajectory...	Triangle Mesh: GOCAD/TSURF, XYZ, Petrel DAT	
WITSML (data streaming directly into WITSML server)	Cloudian	Seismic geometry: Prestack, volume, 2D lines			
OSIsoft	CosmosDB				
Relational Query Access					

Security / System Management

User Management / Preferences	Admin		Security	
Manage domains, groups and users	Import files (CSV, LAS, ASCII, WITSML)	Import by reference for well documents, LAS, grid surfaces, point set, horizons	Authentication (Single Sign-on, SSL)	
Manage data access permissions	Import wellhead information	Time zone support for CSV NEW	SAML support	
Manage connectors and queries	Import formation tops	Server pagination for Users, Groups, Projects NEW	Authorization	
Manage projects	Import new users list NEW	Added date/time services to the table NEW	Encryption	
Manage dashboards and templates	Import curve, curve alias, and unit dictionary NEW	Active / Deactivate users in bulk	Usage monitoring, auditing	
Manage domain resources (pattern files, audop files, templates,, map services)	Import schematics dictionary	Share and copy templates to groups NEW	Auditing support	
Manage sharing between users and groups	Import raster files NEW	Share state definitions and formulas		

License management	Import JPEG, PNG and SVG files	Manage cloud services					
	Import pointset data	Seismic cloud indexer					