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Enterprise-wide big data management

PT Saka Energi Indonesia

Real-time data management and 3D capabilities unlock the value in Saka Energi's technical upstream data.

Project overview

Operating oil and gas blocks in Indonesia and the United States, Saka Energi is constantly acquiring volumes of new technical data such as well, seismic and geospatial data. Managing and safeguarding this valuable information and making it available across the exploration and production value chains requires a comprehensive data management process, where data can be stored in a single corporate database and accessed by users across the organisation.

Saka Energi in focus:

PT Saka Energi Indonesia is the upstream oil and gas subsidiary of PT Perusahaan Gas Negara, Indonesia's largest natural gas transportation and distribution company.

It operates six exploration and production blocks in Indonesia — Pangkah, Sanga-Sanga, South Selulu, Wokam II, Pekawai and West Yamdena — and holds minority stakes in six oil and gas blocks at home. It also maintains a 36 per cent working interest in the Fasken Field shale gas block in the US.

One of the company's most valuable assets is its upstream technical data — the volumes of which grow as the company's exploration and production activities expand. The management of the data is not only a contractual requirement for Saka Energi, but also an operational necessity.

To be able to maximise the value of the data, Saka Energi embarked on a project to build a corporate data management portal to catalogue, validate, track, manage and dispose of data accurately and efficiently, ensuring data integrity and optimum returns to the company.

“ A centralised data repository with well-defined workflows powered by ArcGIS provide users with the tools to efficiently manage data. ”

Yudi Syahnur – Sr Data Management Analyst

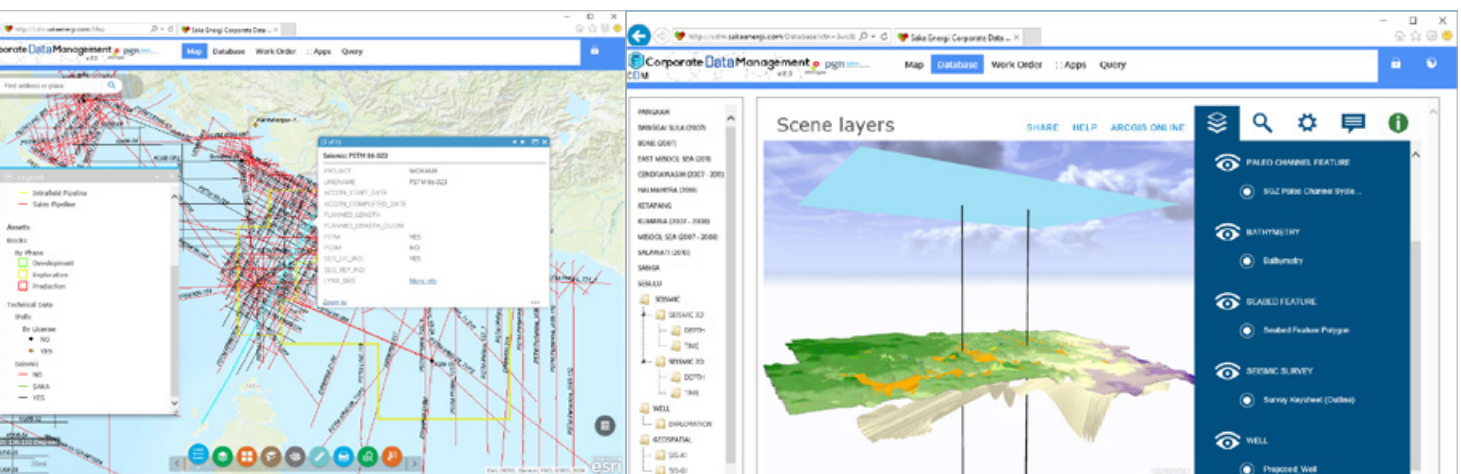


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The challenge:

By nature, the upstream technical data received by Saka Energi comes from various sources — whether it's purchased, operational, or sourced from vendors and data rooms or other exploration and production activities — and therefore comes in varying formats.

Data also comes in through different departments at Saka Energi and is therefore compartmentalised and maintained in disparate locations that are unsearchable and not accessible to the whole organisation.

Furthermore, Saka Energi's Joint Study Agreements with the Indonesian government include statutory and contractual requirements for data management, the non-compliance of which could lead to criminal charges, contract termination or business license revocation.

To achieve its data management goals, Saka Energi set out to:

- + Identify available data and its sources.
- + Ensure all incoming and internally created data is catalogued in a central location.
- + Ensure data for which the company only has a limited-duration license, will only be maintained for the legally permissible time.
- + Appoint technical assistants to register all technical data entering the company onto the relevant database (both hardcopy and digital data including any data received via email, ftp sites etc.).
- + Record the process of passing data from the technical assistant to the data management department.
- + Maintain a copy of all technical data in a corporate repository with all the relevant metadata.
- + Manage the sharing of technical data with data transmittal forms that are to be signed and stored for reference.

The solution:

Addressing the various aspects of Saka Energi's data management requirements, the Corporate Data Management (CDM) Portal was launched at the end of Q1 2017 to Geological, Geophysical, Reservoir & Engineering (GGRE) users who have reported saving significant amounts of time finding data for ongoing projects and research.

Designed, built and deployed to integrate validated Saka Energi upstream technical data into a single repository accessible across the organisation, the CDM includes three main features:

- + **Workflow capabilities:** An upstream technical data management workflow.
 - + **Web-based maps:** Spatial Dashboard using Esri's ArcGIS Server combined with Lynx's Well and Seismic web viewing capability.
 - + **Database:** The capability to establish a customised, standardised Saka Master Database that complies with PPDM v 3.9.
- The workflow capability of the CDM manages the process of receiving and recording data to requesting and sharing it. It is also equipped with generic e-forms to help users with data acquisition requests or data incoming and outgoing transmittal forms.
- The data management process in the CDM is as follows:
- + Identification of available data, its source and internal location.
 - + New data is delivered to a department's technical assistant with relevant metadata (information on its source, which asset it pertains to, whether it is proprietary, released or trade data and whether it is to be checked out to end users or not).
 - + The technical assistant passes data and relevant information to the data management team.
 - + Data is stored in one of the following databases:
 - **PPDM:** Contains "non-production" well and seismic data. This includes navigation, headers, deviation surveys, check shots, formation tops, etc.

- **SDE:** Database for GIS applications that contains either derivative (views from other databases or vendor supplied data) or original (Saka generated information) spatial information, including cartographic data, well, culture, lease and license information and seismic data locations.
- **DMS:** A catalogue of all hardcopy data, including rocks and fluid samples as well as electronic media such as tapes and disks.

- + Technical data being sent to partners is accompanied with a data transmittal which will be signed by the recipient and returned to the data management team for filing.

The innovations:

In addition to defining the data management workflow, the CDM offers a web-based map portal powered by ArcGIS Server and Lynx application, providing users with the tools to query and access data assets in real-time via an interactive map with the capability of adding feature layers and geospatial measurements. Additional tools are available to expand the capabilities, including Spatial Query, Search, Location Finder and Map Printing.

Lynx is collaborated into ArcGIS feature classes to allow viewing of seismic and well data as separate services and is deployed using seismic and well metadata information with the original data stored on Saka Energi servers.

Esri CityEngine is used to view seabed survey data model (SSDM) in 3D directly in the web portal as a CityEngine Web Scene (3ws) — a custom, web-optimised format using a computer-generated architecture (CGA) that creates a refined and detailed design that can be shared and viewed. Going forward, Saka Energi plans to capture its 3D models with drone images that will be stored and displayed using this technology.

The CDM's third feature is its database portal which displays information on seismic and well data combined by PPDM table templates inside a SQL server database. The information is gathered by cataloguing all seismic and well metadata — whether generated by Saka Energi or purchased from another company. Users can find information about seismic and well properties, plus licensing information and view it in 3D.

The outcomes:

While the CDM was initially built to manage upstream technical data, it is recommended to broaden the scope of the data to include petrophysical, geochemistry and well trajectory planning data to save time and efficiently manage data across the organisation's operations.

The key outcomes from the platform include:

- + **A centralised data repository** with well-defined workflows for efficient data management.
- + **Time saved** finding the right data for research and proposals.
- + **Compilation of data** from disparate sources increases data accuracy.
- + **Real-time access to data** with feature layers.

Solution mix:

- + **ArcGIS Online**
- + **Lynx applications**
- + **CityEngine**

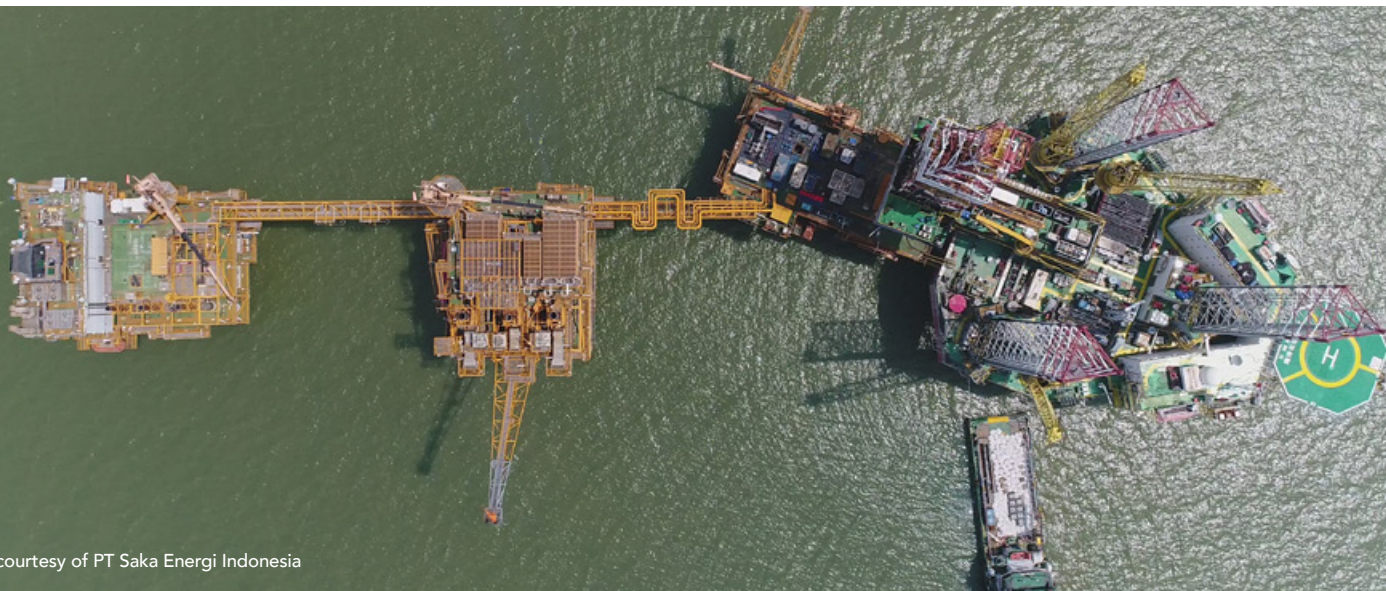




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