

Operational Excellence in FPSO Construction

With MineRP GeoOperations



Positioning Paper



Problem statement

The FPSO (Floating Production, Storage and Off-loading) industry is undergoing substantial changes due to the drop in the oil price and increase in price volatility. This has resulted in less opportunities for FPSO contracting and execution. There is also an additional challenge to deliver cost effective projects. Besides the oil price, the other top challenges identified are delivering projects on time, cost control, project engineering and design.

EPCM role players, either in house or external, have so far been forced to use disparate and stand-alone engineering applications to manage the execution of capital projects. Integrating the engineering processes from such a scattered landscape into the financial business processes of an ERP system is a major challenge. Often connectivity is established via monthly project, performance and progress uploads into the ERP system resulting in a lack of visibility by the executive managers. Project reporting is often complex, hampering decision making during the project execution phase.

MineRP's value statement

MineRP have partnered with HCL & Colaborite international to develop a innovative Mega Project Management solution for integrating the entire information landscape.

This includes everything from engineering planning and design to cost,schedule and execution management.

The spatial capability offered through the MineRP GeoOperations solution allows full inter-operability across the technical systems in use. This is achieved by amalgamating the aboriginal technical (and mostly spatial) data onto the MineRP Spatial Resource Management Platform, allowing continuous visibility of the spatial locations of each part on facility as it progresses through the construction project phases. This singular identification and tracking of spatially managed entities provides a framework for cost, schedule and other resource application and tracking in downstream ERP and execution management systems.

In addition to integrating source-systems through bi-directional connectors and converters, MineRP spatially enables many other systems supported by strategic partners such as SAP, IBM and HCL.

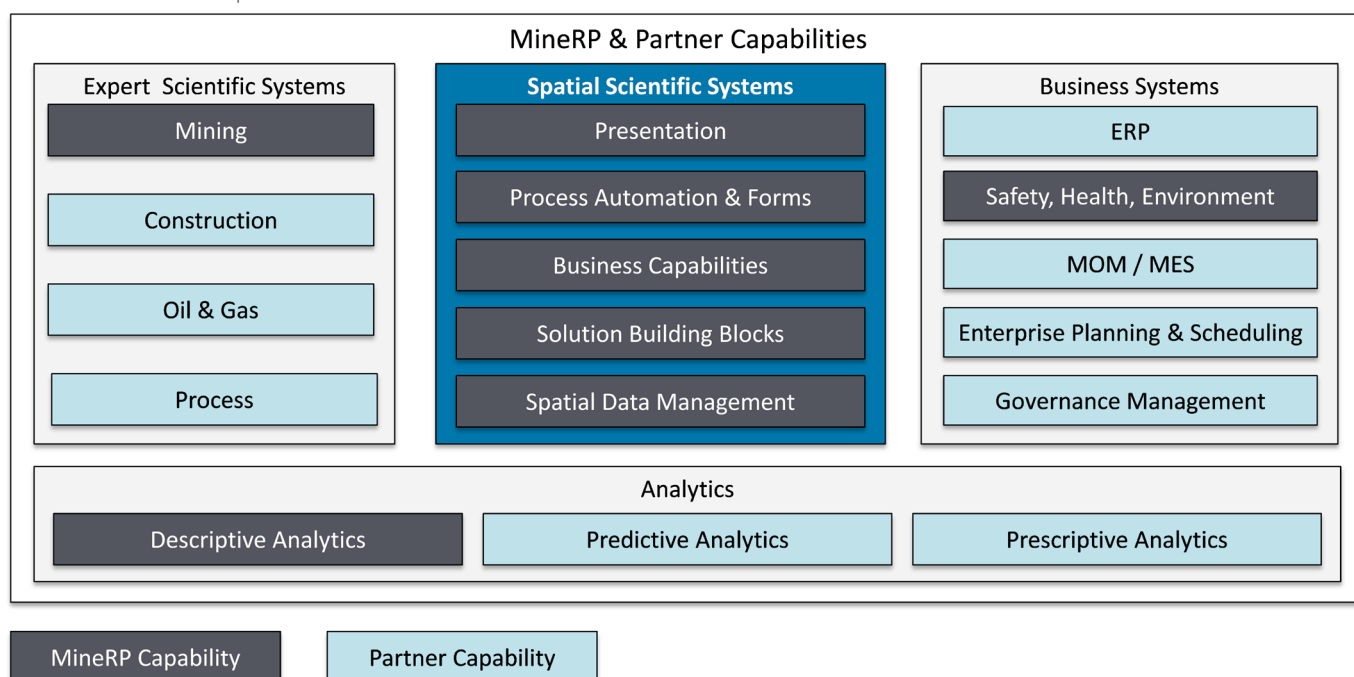


Fig 1. The MineRP spatial inter operability

MineRP's spatial visualization tools offer role-base access to integrated information superimposed in either 2D or 3D onto the plant or construction environment - enabling spatial descriptive analysis and workflow capabilities.

In addition to amalgamating data for visualization purposes, the standardization of data stored in the MineRP Spatial Resource Management platform significantly prepares data for further predictive and prescriptive analysis to be done by MineRP's partner solutions. Moreover, the platform facilitates spatial collaboration by means of Boardroom-to-planning room workflow for timeous execution of corrective and preventative actions.

Solution overview

The MineRP GeoOperations solution provides the user with accurate, accessible and actionable insight throughout the project life cycle. At the core of the solution is MineRP's Spatial Database which is the primary storage mechanism that enables management of 2D & 3D objects with extended capabilities and functions for hosting industry specific data types and methods.

The spatial environment provides the following functionality:

- CAD integration allowing amalgamation of various sources with capability to further attribute the available design information.
- Spatial representation of technical asset and equipment information.
- Integration with third party portfolio management facilitating portfolio spatial information.
- Third party project management Integration.
- Representation of the building process by using BIM (Building Information Management) principles, now in an intelligent 4D context with an added time component.
- Enable snag list control with added 3D visibility of where the particular issue exists.
- Introduction of RFID technology in the supply chain processes.
- Spatially store and represent material and equipment tracking .
- Spatially identify Functional Breakdown Structures, which enables the visual identification of project functional components. This also allows full history tracking by connecting the source information with the Mega Project Management solution.

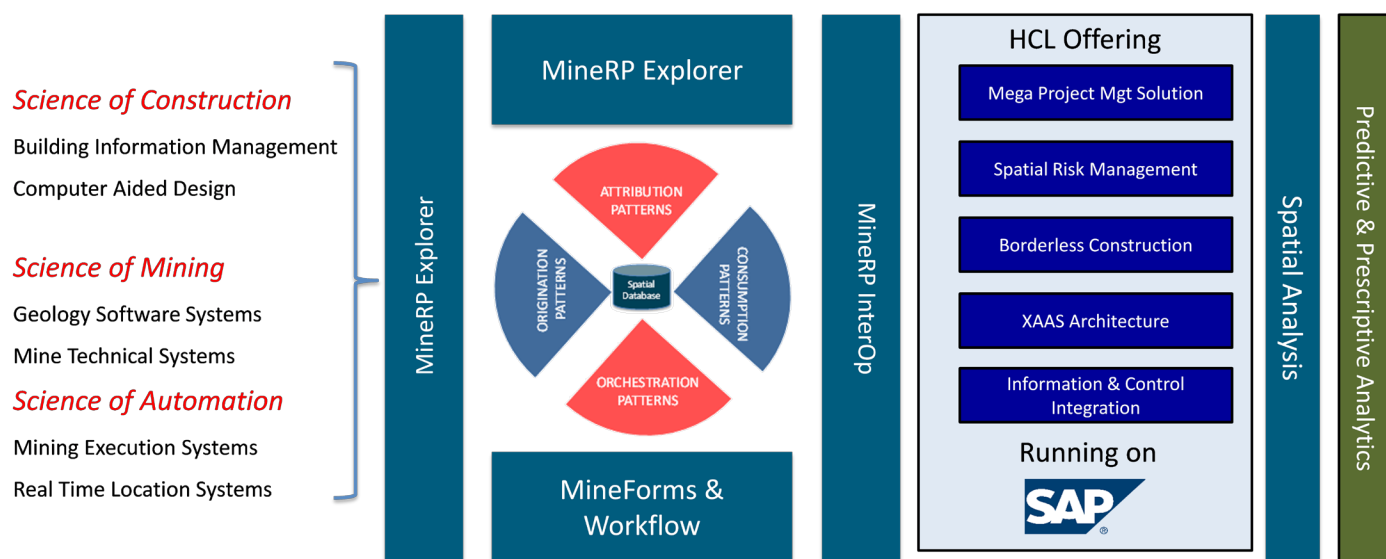


Fig 2. The MineRP GeoOperations solution domain enabling spatially inte-

Solution insights

The MineRP GeoOperations solution utilises MineRP's spatial integration platform to combine information from source applications, including;

1. Technical Systems such as:
 - Building information management systems
 - CAD (computer aided design) tools
 - Supervisory control systems
 - MES historians
 - Operations management applications,
2. In-memory databases such as:
 - SAP HANA
 - IBM DB2 with Blue Acceleration
 - Microsoft SQL Server 2014
3. ERP Systems such as:
 - SAP
 - SAGE
 - IFS

This list excludes data from other source applications used to create spatially contextualised operational control dashboards, which are accessible from planning room to boardroom.

Spatial analysis has been used with huge success in a number of mining organisations and is now applied to the FPSO industry. MineRP's Spatial Resource Management Platform provide exceptionally portable, highly customizable and spatially integrated reporting capabilities, which allow for site, portfolio or group level spatial perspectives to be made available over the web.

The provided environment facilitates:

- Cloud-based Planned vs Actual reporting.
- Real time reporting and analysis of 3D operational data from multiple sources.
- Role-based operational & executive reporting dashboards, on a need to know basis, with built-in workflow.
- User definable hot-spot views provided on operational / executive spatial dashboards.
- Automation, execution and monitoring of business processes.
- Faster inter-discipline communication, thereby improving safety, efficiencies and reduction of costs.

The MineRP GeoOperations solution is workflow enabled at any level and at any point. The workflow provides:

- Delegation of work thereby creating accountability and driving policy.
- Tracking of action plans & deadlines.
- Facilitation of change and automation of escalations.
- Integration systems which allow full monitoring of business performance.
- Streamlining of operations allowing business.

In Summary

Implementing MineRP's GeoOperations Solution as part of the HCL Mega Projects offering allows you to:

- Embed and enforce solid project governance, administration and support processes.
- Improve speed & confidence of decision making in the main project engineering processes. This facilitates better and quicker business decisions by visually relating and analysing technical information from a variety of sources and disciplines.
- Provide accurate KPI reporting and forecasting of trends using any source system making full visibility in a logical, spatially orientated context possible.
- Facilitate collaboration across enabled companies, thereby optimizing review processes.
- Reduce project execution time and therefore shorten the project time to market. Which in FPSO terms means time to sail.
- Implement MineRP's Spatial dashboards, which enable EPCM companies to optimise their entire value chain from inception to final delivery.

Making accurately informed operational and tactical decisions is critical for FPSO companies to remain competitive. With our spatial platform we can help you achieve this.

Construction Resource Planning Positioning Paper

Author

Ruud van Nieuwenhoven
Industry Executive



www.minerp.com

South Africa

Head Office: Johannesburg
First Floor, 267 West Ave, Centurion 0046
PO Box 9157, Centurion, 0046
Tel: +27 87 980 3100
Fax: +27 86 406 0117

Eurasia

Istanbul Office
Barbaros Mah. Kardelen Sok.
Palladium Tower No:2 K:10 D:41
34746, Atasehir, Istanbul, Turkey
Phone: +90 216 687 0357
Fax: +90 216 687 0303

Canada

Sudbury Office
430 Westmount Avenue, Unit L
Sudbury, Ontario, Canada, P3A 5Z8
Tel: +1 705 525 4774
Fax: +1 705 525 2629

Latin America

Santiago Office
Av Isidora Goyenechea 3000, piso 23
Las Condes, Santiago, Chile
Tel: +56 2 364 4258
Fax: +56 2 364 4443

Australia

Brisbane Office
Level 1, Old Mineral House
2 Edward St, Brisbane, QLD, 4000
Tel: +61 7 3828 2800
Fax: +61 7 3828 2802

Perth Office

2/44 Denis St
Subiaco, Perth, WA, 6008
Tel: +61 8 6380 6800
Fax: +61 8 6380 6801



MinERP

FPSO photograph on front page obtained from BW Offshore website
www.bwoffshore.com/media/photos/fpso