Operational Excellence in Mining Construction

With MineRP GeoOperations

Positioning Paper

MineRP

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Problem statement

The recent weakening in demand for metals and minerals combined with the resulting drop in commodity prices has put new pressure on global mega projects in the global mining industry. According to a recent study by Ernest & Young[1], overruns of the approved budget and schedule are the norm for such projects. These are also some of the biggest reasons for reduced levels of capital productivity and commercial performance.

EY identified several causes for these overruns. While Project Management was the key factor, other causes included stakeholder conflicts, resource constraints, regulatory and policy related issues as well as unfavourable external environments. The most serious project management issues were inadequate planning, poor rigor in cost and scheduling estimates and owner/EPCM and contractor relationships.

Many project management issues are related to the fact that 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 integration is based on 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

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 bidirectional connectors and converters, MineRP spatially enables many other systems supported by strategic partners such as SAP, IBM and HCL.

Fig 1.

(1) Opportunities to enhance capital productivity, EY, 2015.

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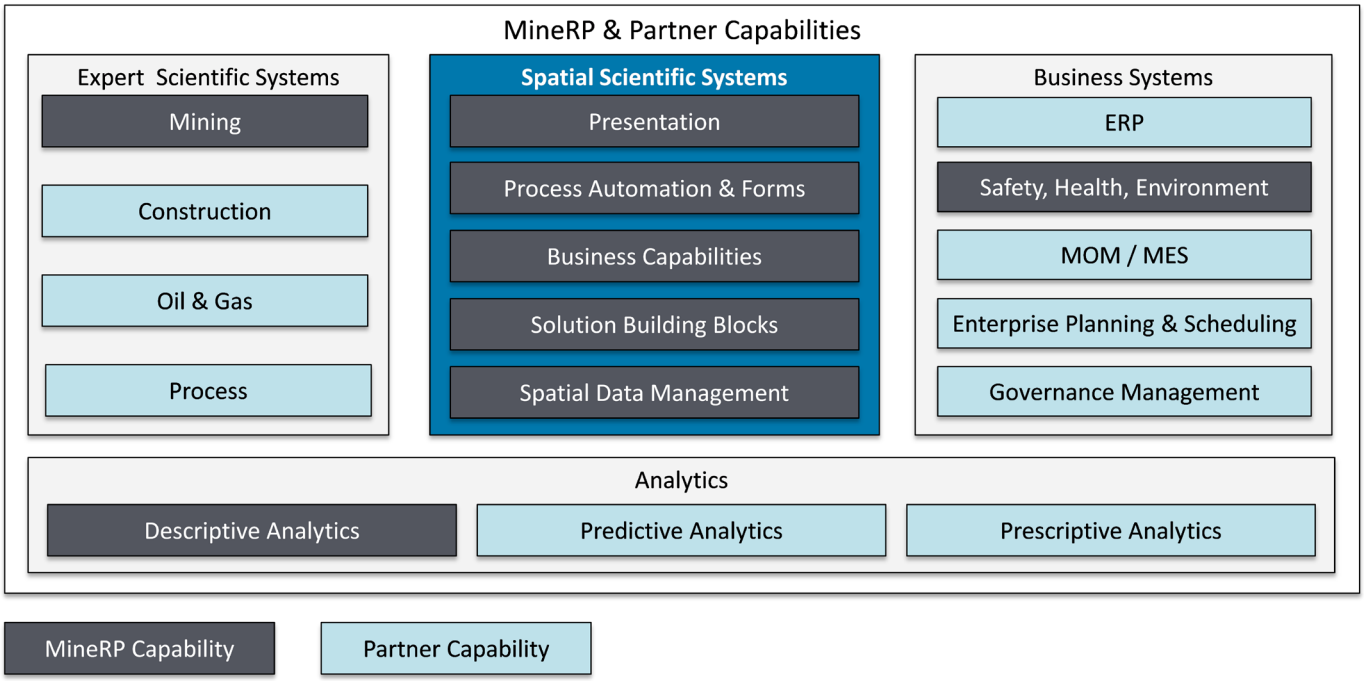

Fig 2. The MineRP spatial inter-operability

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 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 spatial management of 2D & 3D objects. These objects have 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.

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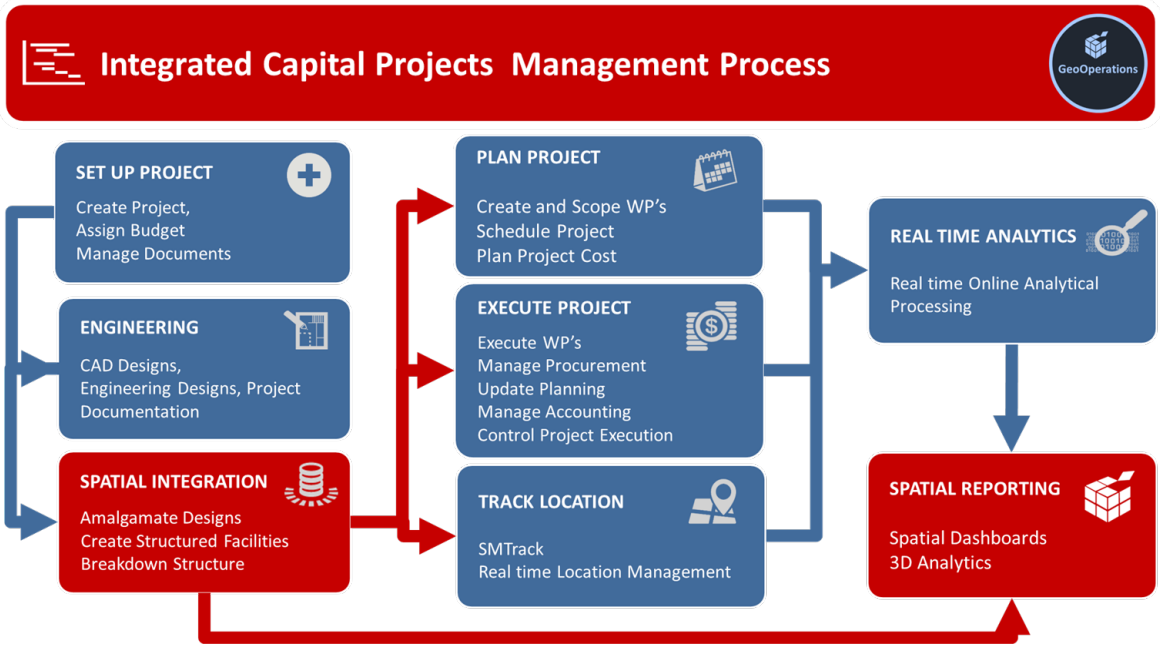

Fig 3. The MineRP GeoOperations solution domain enabling spatially integrated technical disciplines

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 Mega Projects 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.

For Site, Portfolio or Group Level Spatial Perspectives to be made available over the Web.

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.
- Implement MineRP's Spatial dashboards, which enables EPCM companies to optimise their entire value chain from inception to final delivery.

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

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Construction Resource Planning

Positioning Paper

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