Tightening control over scheduling

A tight relationship between orebody knowledge, mine plans and schedules allows operations to analyse deviations and take corrective action at the right time.

Planning engineers who understand that strategic and tactical planning have different objectives and require different environments will be able to apply Maptek's scheduling solution to obtain the best value from mining their deposits.

Industry challenge

For a long time the weak point has been the connection between orebody knowledge and the activities and processes conducted to realise the economic benefits of that orebody. We all recognise these scenarios:

- Planning engineers working with scheduling solutions that take a siloed view of the overall success of a mining operation.
- Mine schedules that target results that may look good in one context but have no bearing on the long term economic success of a mine.
- Parametric mining and economic value models that are based heavily on assumptions and with little or no bearing on actual performance in the mine or processing plant.
- Optimisation of factors that are meaningless to the overall success of the mine.

Many solutions claiming to provide enterprise wide planning and scheduling capabilities simply do not. A Gantt chart is not a mine planning and scheduling solution, it is a tool to help sequence and plan tasks.

Mine planning without reference to the geological model is not able to ensure that the economic value of an operation is maximised over the long term.

Ignoring downstream comminution or beneficiation processes that may be heavily influenced by mining decisions or geological factors is leaving value on the table.

Maptek solution

With the release of Evolution 6 Maptek™ will deliver the most comprehensive and advanced set of mine scheduling and optimisation tools to date.

> This will radically change the way mining companies are able to evaluate, manage and drive improvement across their operations.

This paradigm shift is made possible by significant technology research, development and investment over many years.

Short interval control and short term planning decisions need to be made quickly and with knowledge of the impact that changes may have on the future of the mine. This may mean the next shift, the next month or in five years time.

It may seem unlikely at the time that short term schedule decisions can impact longer term performance of a mine.

However, many real world examples of resource sterilisation, geotechnical risk, inefficient energy use or poor processing plant performance have been caused as a result of short term planning decisions. It is the embodiment in mining of the butterfly effect.

Introducing Epoch

At the short term and execution stages a new level of detail, flexibility and visibility is required for managing day-to-day and in-shift schedules.

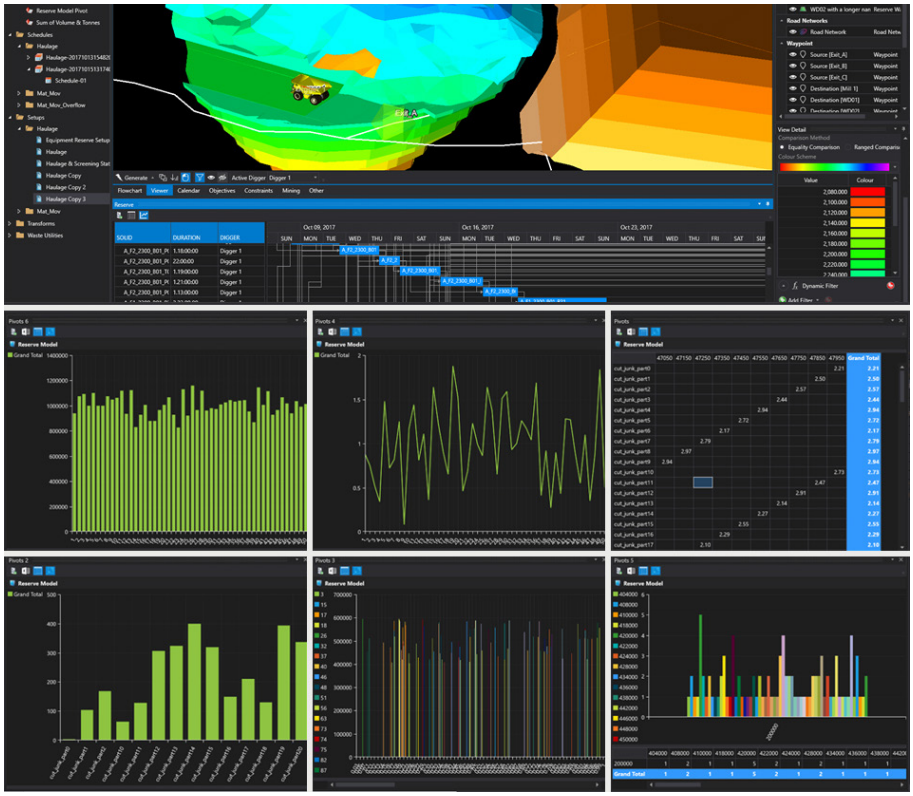
This is handled by Evolution Epoch, available alongside new functionality in Origin and Strategy as part of Evolution 6.

Using Epoch, short term planners will be able to:

- Sequence and schedule individual equipment, tasks, crews and locations.
- Apply rules and task sets and precedences.
- Deal with the variability and uncertainty in some mining situations and the need to avoid ambiguity.
- Ensure that all production engineers and crews know what is planned, what decisions have been taken and the impact on the rest of the mine.

An interactive Gantt chart linked to a 3D graphical view of the mine shows equipment, task and location for all mine resources.

Short term planners and production managers can visualise what is planned and can control the schedule.



Live dashboards

Evolution Epoch is integrated with the orebody as well as the mine plan, and can be shared within the mine and displayed on dynamic dashboards.

So what? Dashboards are in every production office. The difference is that the short term schedule determined in Epoch is built around achieving the long term maximum value for the mine and the orebody.

Epoch incorporates all of the typical benefits of schedule management tools, such as task sequencing, mining rules setup, resource and equipment models with the integration of a graphical view of the mine, and it also targets the longer term objectives of the mine.

Planners are now fully able to selectively evaluate the short term plan quickly and easily to best meet their objectives using the resources and equipment available on the day and react to changes mid shift.

This adds value by retaining connection to the long term business plan for the orebody through the geology and optimised mine plan.

As mid term plans are updated, optimised and adjusted, new short term planning is aligned and targeted to achieve these new plans. They are all working from the same data as an integrated planning solution.

Decision support

Maptek is developing functionality to enable simultaneous long term scheduling and short interval control. Short term planners will be able to immediately evaluate the impact of short term decisions on longer term mining performance, operating in a decision support environment that has never before been possible.

Connecting Evolution Epoch to the live production control and management systems within a mine will enable real time comparison of the plan in the Gantt and graphical environment.

This will also allow the Evolution genetic mine optimisation algorithm to conduct reactive evaluation of the impact of delays or deviation from plans, supporting control room decisions that are both connected to and respect long term value optimisation.

Paradigm shift

The traditional ways of scheduling are now irrelevant and outdated.

Closing the loop between short term scheduling and execution, while providing real time feedback to planning and production supervisors regarding deviations and actual progress is a significant opportunity for industry.

Maptek understands the pressures inherent in production scheduling and has created a life of mine scheduling solution that works at the finest levels of short term planning and optimises across all time horizons to maximise orebody value. This is done quickly and neatly via an efficient user interface.

In collaboration with PETRA Data Science and application of their MAXTA digital twin models, this solution can be extended to include processing stages and product recovery/yield. This will, for the first time, enable the entire mining value chain to be modelled and managed properly.