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Insights

The future of work in mining
What will jobs look like in intelligent mining operations?

Integrated master scheduler

Traditional mine planning role evolved to ensure compliance with mineral resource management through digitally enabled integrated planning (from Life of Mine to daily shift allocations), scenario rationalization enabled by predictive analytics, and utilization of asset reliability and employee data to do the overall, integrated master schedule (i.e., mine, plant, assets, people, logistics, etc.)

TUES

MAY

2020

10:30

INTEGRATED MASTER SCHEDULER

Summary

The integrated master scheduler is responsible for determining the best way for a mining company to extract a resource from the ground by sequencing waste removal and ore extraction to ensure continuity of production output and sustainability throughout the life of a mine. The traditional monthly mine plan is enhanced through integrated systems and production measurements, which enable the quick generation of short-term, medium-term, and long-term plans, considering various scenarios for those plans. They champion integrated operations scheduling and its associated tools, routines, and positions at site during project implementation and adoption monitoring. The integrated master scheduler collaborates with the Nerve Center orchestrator and Nerve Center data scientist to ensure integrated work management is linked to the master operations schedule that integrates production, maintenance, development, and support schedules into one master schedule. They use throughput knowledge from the Nerve Center to integrate and inform maintenance, workforce, mining, and business plans and schedules, as well as to understand the nature of variability and interdependency within the systems. The integrated master scheduler develops short-term production schedules using existing business plans, taking into account the multiplicity of production objectives, constraints, resource requirements, planned maintenance, resource availability, consumables, human assets, machines, and equipment needed to do the scheduled work.

Responsibilities

- Review existing Life of Mine plan and provide alternative parameters to generate multiple technical planning alternatives for financial and logistical feasibility testing

- Manage integration of plans across functions to identify and resolve conflicts

- Run scenario models based on compliance to plan trends and conduct business plan impact modelling to assess the financial impact

- Apply throughput insights from the Nerve Center to integrate various plans and schedules, and to understand interdependency within the systems

- Develop a short-term master production schedule that adheres to the planning framework

Time spent on activities

- Scenario modelling ■ Integration of maintenance, workforce, mining, and business plans/schedules
- Compliance with plan tracking ■ Collaboration

| 20% | 30% | 25% | 25% |

Skills and endorsements

HUMAN

⊕ Complex planning and forecasting · 342
Endorsed by **Kelly** and **Jeremy**, who are highly skilled at this

⊕ Attention to detail · 250
Endorsed by **Rob**, who is highly skilled at this

⊕ Process improvement · 374
Endorsed by **Adil**, who is highly skilled at this

⊕ Communication (empathetic) · 236
Endorsed by **Blythe** and **Joanna**, who are highly skilled at this

⊕ Collaboration · 467
Endorsed by **Edward** and **Ruby**, who are highly skilled at this

TECH

⊕ Scheduling · 414
Endorsed by **Samia**, who is highly skilled at this

⊕ Data modelling · 368
Endorsed by **Sylvia** and **Julian**, who are highly skilled at this

⊕ Data analysis and interpretation · 565
Endorsed by **George**, who is highly skilled at this

⊕ Statistical analysis · 486
Endorsed by **Rose**, who is highly skilled at this

⊕ Data visualization · 324
Endorsed by **Michael** and **Holly**, who are highly skilled at this

PAM JONES

INTEGRATED MASTER SCHEDULER
Mining Inc.

Pam is a realistic individual who sees the business value in collaborating with others. The Nerve Center provides Pam the opportunity to have access to multiple sources of data. She likes to plan ahead and enjoys being a part of a digitized work environment—attributes that created the opportunity for her to work within the Nerve Center.

Experience

Integrated master scheduler
Mining Inc. | *Aug 2019 - present*
Works within the Nerve Center to ensure compliance to the mineral resource management (MRM) plan and is the custodian of the master schedule

Master scheduler
Mine AB | *Jul 2017 - Jul 2019*
Reviewed productivity rates to determine ways to increase efficiency

Materials planner
Colliery | *Jun 2015 - Jun 2017*
Planned all procurement demands for sales and production

Education

• **Logistics, materials and supply chain management degree**

Toolbox

Nerve Center
A visual display that presents data, live information, and analysis from multiple sources to facilitate informed decision-making

Integrated Mine Planner
A tool that provides an integrated plan coordinating activities across the internal value chain of the business

A DAY IN THE LIFE

0 7 : 1 5 AM | Arrives at the Nerve Center and reviews the MRM overview on the Nerve Center dashboard

0 7 : 3 0 AM | Attends the daily shift start-up meeting to review the KPIs of the operation and understand any issues that the operation is currently facing

0 8 : 1 0 AM | Reviews and tracks the progress on daily team production planning and notices that the eastern section is in the red and below-target for the afternoon shift

0 8 : 3 0 AM | Investigates the above-mentioned issue by seeking to understand the amount and quality of raw material. This involves contacting the correct individuals. Findings suggest that waste was blasted. Follows the standard template to collect material from each area ahead of the weekly site alignment meeting scheduled for 01:00 PM. Each area should provide baseline data in the online site alignment meeting to demonstrate plan variance (both positive and negative) week by week and show the impact on the schedule

1 0 : 0 0 AM | Conducts business plan impact modelling to assess the financial impact of the missed production targets on the eastern section due to the waste blasted

1 1 : 3 0 AM | Adjusts the short-term schedule to match the required production targets after understanding the impact

1 1 : 4 5 AM | Updates the geological grade model according to sampling carried out by geological testing

0 1 : 0 0 PM | Joins the weekly online site alignment meeting focusing on integrated planning via video conferencing and follows up on actions arising from the waste blasting identified earlier that morning. Spends time integrating the Life of Mine, medium-, and short-term plans with colleagues. Coordinates feedback from all areas to uncover potential conflicts. Records action items during the meeting, reviews action items at the end of the meeting, and distributes captured actions after the meeting

0 3 : 0 0 PM | Compiles and updates daily, weekly, and monthly statistical reports related to the integrated plan

0 4 : 0 0 PM | Collaborates with the Nerve Center team to help attain MRM goals and objectives and commits to achieving targets for her area of responsibility

0 4 : 3 0 PM | Ends shift and heads home

About the authors

ANDREW SWART is both the global and Canadian leader of the Mining & Metals practice as well as the global leader for the sector. In his global roles, Swart leads a team from around the world and sets the strategic direction and go-to-market strategy for the global practice. With 20 years of industry and consulting experience, he is passionate about client service, having worked across many major mining and metals geographies, including Canada, Chile, Russia, Ukraine, Kazakhstan, Brazil, Germany, India, South Africa, the United Kingdom, and the United States. Swart's areas of expertise include corporate and competitive strategy engagements, digital and innovation systems, and large organizational transformation programs.

JANINE NEL is Deloitte's global Future of Work leader for Energy, Resources & Industrials, and Deloitte's global co-lead for the People & Diversity pillar of the mining and metals group. Leading delivery and thought leadership in the area of digital and its impact on work, Nel focuses on the workforce and the workplace in the future of work. She helps clients unpack the elements of work that are truly human, what can be done by machines, and what this means for people. She is also part of an effort that pioneers the people impacts of the mine of the future.

JULIE HARRISON is Deloitte's global co-lead for the People & Diversity pillar of the mining and metals group, and Deloitte Australia's Human Capital lead for Energy, Resources & Industrials. Harrison has worked extensively in consulting for the past 25 years and within the ER&I sector for nearly 15 years where she has led many transformation programs with a strong focus on people-centered transformation. Her areas of expertise include global transformations, organization redesign, workforce optimization, HR transformation, leadership and culture, and global talent programs. Passionate about the future of work, Harrison is a regular speaker at local and international conferences.

TALITHA MULLER is the Future of Work program manager for Deloitte Africa and a member of the Global Future of Work Regional Leadership forum. Muller plays an integral part in leading the Future of Work movement within South Africa by providing strategic guidance to business leaders on navigating the complexity of digital disruptions pertaining to changes in work, workforce, and workplace, and how to create exponential professionals.

JENNA WING is an industrial psychologist with two years of experience within the Energy and Resources industry. Wing has worked with the Future of Work team on developing the digital Nerve Center solutions for the intelligent mine. She focuses on the future of the workforce, the change in skills and capabilities, how roles will be deconstructed, and the business case for reskilling/repurposing people. Through creative ways of working and learning, Wing wants to continue to be a part of, and build, high-performing teams by challenging everything we do from a personal, work, and mindset perspective.

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Deloitte Consulting's Mining & Metals practice has helped clients transform to integrated operations through the adoption of digital technologies, artificial intelligence, and analytics solutions. Our future of work assets examine what future mining jobs will look like and enable the fundamental redesign of work, workforce, and workplace. Our work in intelligent mining includes the realization of operational efficiency improvements, enhanced decision-making and productivity, improved safety performance, remote management of resources and optimization of workforce allocation. Contact the authors for more information or read more about the future of work and intelligent mining in our mining and metals services on Deloitte.com.

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