



**Rockwell  
Automation**



ManpowerGroup®

# A connected workforce strikes gold

**MINING FOR DIGITAL ERA TALENT**



# The digital era mandates new approaches to mining for ore *and* talent

Digital technology has brought improvements to the way mining companies do business, as well as new considerations into the way talent is sourced and retained. The mining industry is facing business, social and environmental challenges right now—it's a perfect storm for change:

- Demand is growing for new and legacy materials
- Ore grades are declining, and new solutions are needed for efficient extraction and processing of material
- Boom-bust cycles continue
- Skills, needs and demographic profiles of employees are shifting
- Experienced workers are retiring
- Safety and environmental impact remain a priority

In light of these dynamic challenges, Rockwell Automation, the world leader in industrial automation, and ManpowerGroup, the world leader in workforce innovation, undertook this study to provide insight into workforce-specific digital era challenges and opportunities for mining companies. We'll share information about evolving skill categories, emerging mining roles to illustrate job evolution, and strategies for modernizing your workforce.



An aerial photograph of a large-scale mining operation. A yellow dump truck is driving on a dirt road in the upper center of the frame. In the lower left, a yellow excavator is working on a pile of material. The ground is dark and heavily eroded, showing deep tracks from heavy machinery. The overall scene is industrial and rugged.

## PART 1

# where are we now?



# Future workforce and digital effectiveness: top risks

EY's top 10 business risks and opportunities—2020 annual study shared the top issues mining companies are facing:

44% of survey respondents say license to operate is the biggest sector risk in mining

The issue of future workforce rises from seventh place in 2019's survey to second

Digital effectiveness remains a top concern

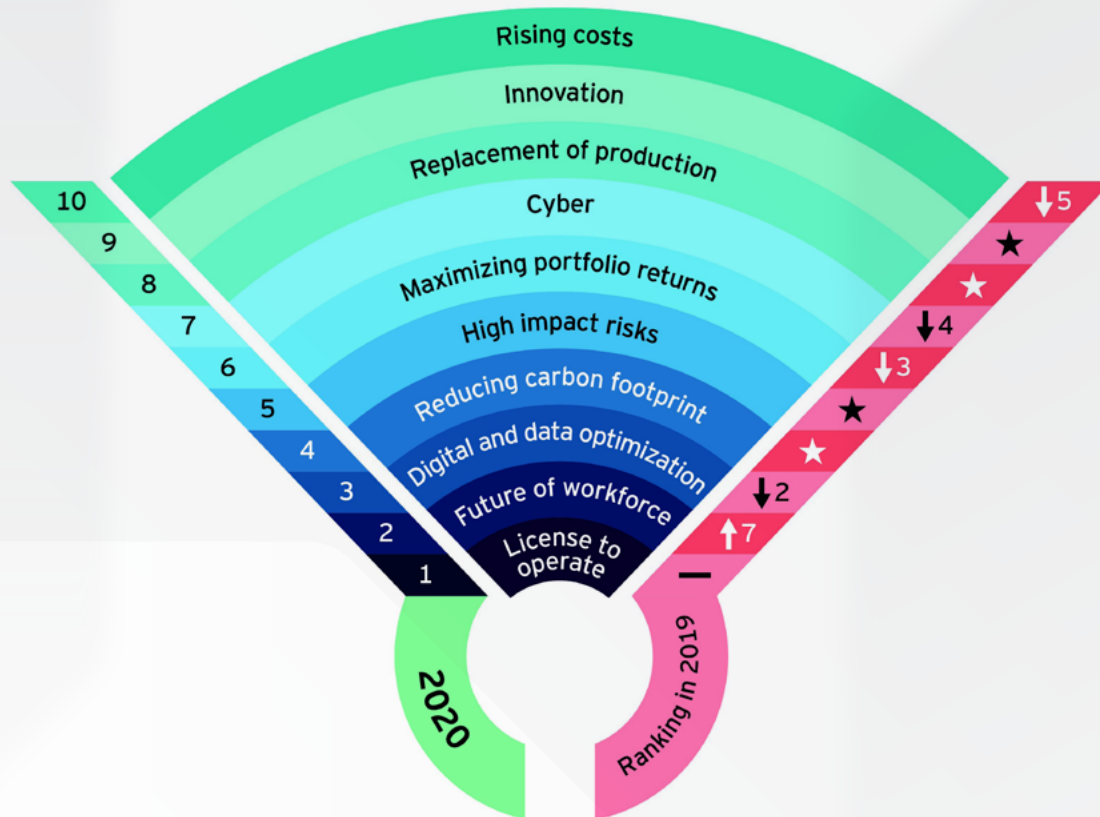
Cyber remains in the top seven issues moving down a few ranks from last year

Innovation makes the list for the first time as number 9 on the top 10 list





# Future workforce and digital effectiveness: top risks



↑ Up from 2019   ↓ Down from 2019   — Same as 2019   ★ New to the radar

Source: EY Top 10 business risks and opportunities - 2020

While 'future of workforce' shows up as a risk itself, designing a strong workforce is also a strategy for addressing many of the risks on this chart, especially digital effectiveness. The space where the connected mine meets the connected workforce is where the magic of modern mining can take place.



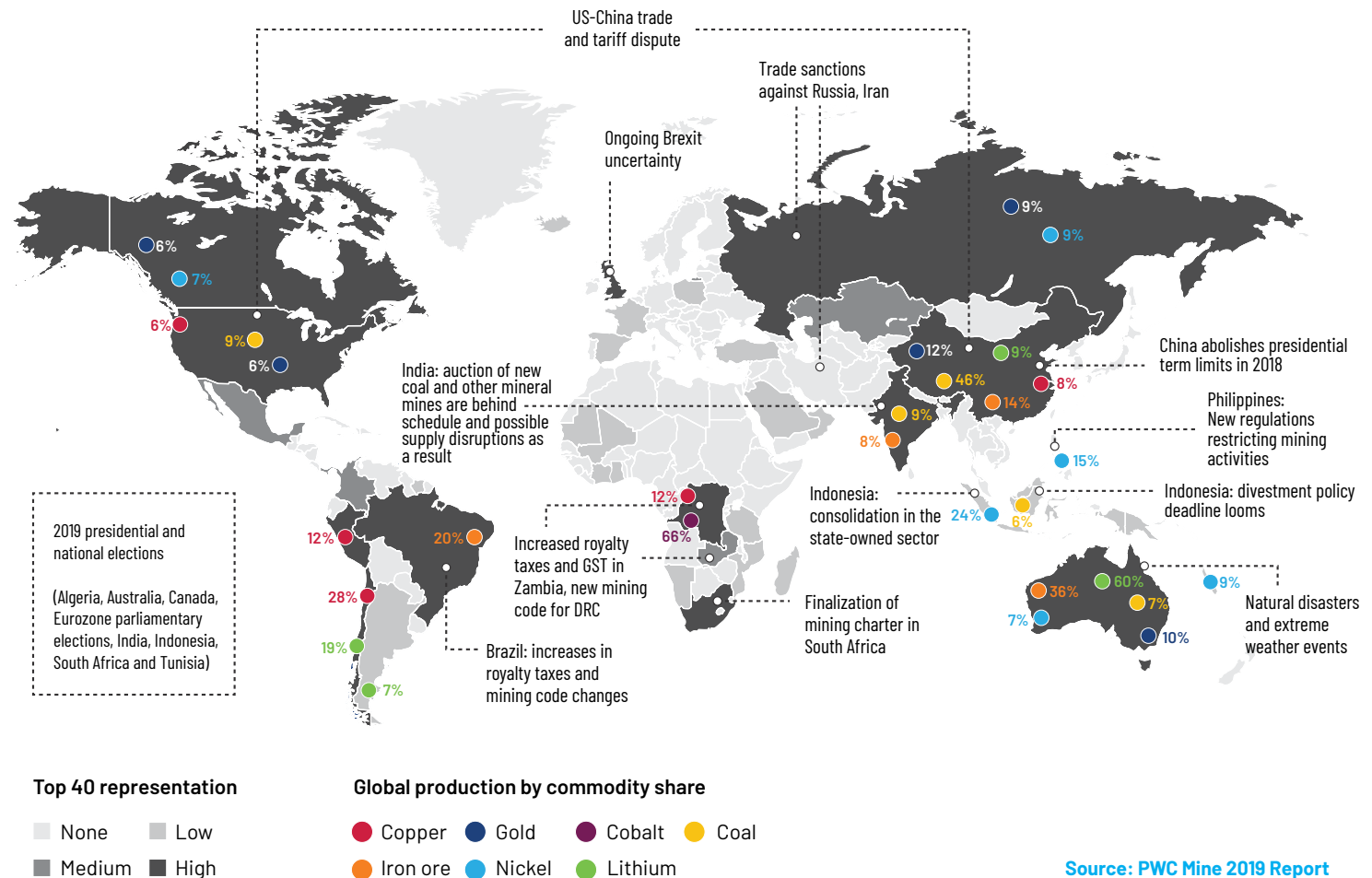
# Global mining production & factors impacting labor

Tariffs, trade sanctions, presidential elections, regulatory and code changes, commercial and state-owned ownership policies and auctions, natural disasters and extreme weather... all of these factors impact mine production as well as the mining labor market.

## 1.3%

Projected job growth  
for mining annually,  
2019–2021

Source: Global Mining Industry Dossier



Source: PWC Mine 2019 Report



# Broader demand and lower yields

Minerals are essential to almost all economies. The quantities required of an individual over their lifetime in a developed economy can be a staggering realization.

## MINING'S DEMAND/YIELD CHALLENGES TODAY INCLUDE:

- How to deal with increasing demand due to urbanization, middle class growth, technology, electro-voltaic battery technologies and energy revolution (total worldwide lithium demand is projected to grow 55% over the next six years topping 477,000 metric tons by 2025)
- The need to address declining ore grades and determine how to cost-effectively access lower yielding sources, yet maintain throughput (for example, over the last 15 years, the average cost of producing copper has risen by more than 300%, while the grade has dropped by 30%)
- Meeting growing expectations and regulations regarding sustainability

Increased demand in a constrained system almost always makes room for innovation. Modern mining companies will be able to build on this rather quickly. The classic mining companies will have different, and likely fewer, opportunities until they speed up their adoption of technology and get access to the tools required to support these new methods. Without digital capabilities, many demand-based opportunities for more or different materials would be more costly or unsafe, if not unattainable. Yet, to achieve these newer horizons for sourcing and extraction, more and different talent disciplines must join the mining talent ecosystem.





# Mining industry hiring trends

## EMERGING AND DECLINING ROLES

Workforce in

2018

2022

Adoption of technology is changing the workforce as we know it. Employees must bring digital skills in order to work with the tools that companies are implementing to enhance productivity and gain visibility. This is evident in the list of emerging roles. We're seeing and increased desire for employees with data science skills and/or experience with emerging technologies like machine learning and AI.

On the flip side, we are also seeing an opportunity for automation technology and robotics to automate some work tasks. In light of this, hiring for many of the roles in mines that require physical labor or repetitive calculations is now on the decline.

### EMERGING

15% in 2018

22% in 2022

#### ROLES SUCH AS:

- Sales and Marketing Professionals
- New Technology Specialists
- General and Operations Managers
- Data Analysts and Scientists
- Process Automation Specialists
- Organizational Development Specialists
- Big Data Specialists
- AI and Machine Learning Specialists
- Systems Engineers
- Supply Chain and Logistics Specialists

### DECLINING

40% in 2018

32% in 2022

#### ROLES SUCH AS:

- Mining and Petroleum Plant Operators
- Accounting, Bookkeeping and Payroll Clerks
- Mining and Petroleum Extraction Workers
- Business Services and Administration Managers
- Mechanics and Machinery Repairers
- Management and Organization Analysts
- Locomotive Engine Drivers and Related Workers
- Heavy Truck and Bus Drivers
- Data Analysts and Scientists
- Assembly and Factory Workers

Source: World Economic Forum Future of Jobs Report



# Mining industry hiring trends

## SOUGHT AFTER SKILLS

Across the globe, we're seeing a shift in the top occupational categories that mining companies are hiring for, as well as the skills they are seeking in new employees.

## BRAZIL

is one of the most active mining countries in the world, and their hiring patterns are indicative of what we're seeing globally:

- Cross-discipline roles—employers are seeking employees who can bring together information in a way that will benefit the business. We're seeing new roles popping up that bridge natural/applied science and engineering as well as architecture/design and engineering.
- Experience with data science tools and techniques is desired
- Employees who can code and bring computer science skills are in demand

## INCREASED MINING COMPANY DEMAND FOR FUTURE SKILLS: BRAZIL

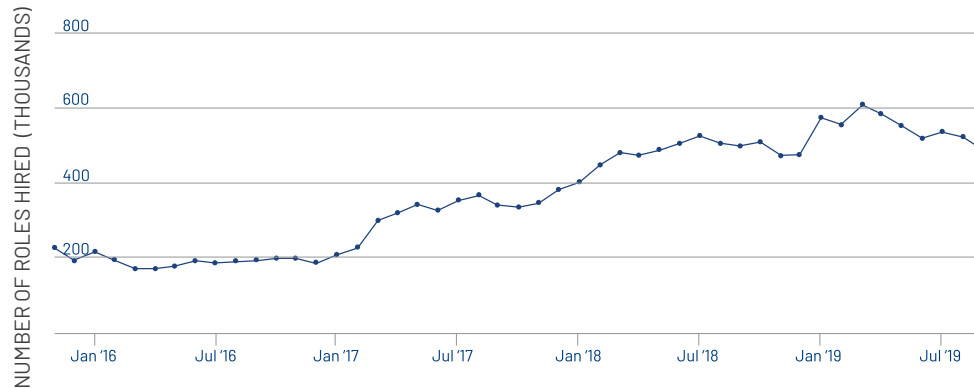
<b>MOST SOUGHT AFTER SKILLS</b>	<ul style="list-style-type: none"><li>• Structured Query Language</li><li>• Python</li><li>• Machine Learning Techniques</li><li>• Data Mining</li><li>• Big Data</li></ul>
<b>TOP OCCUPATIONAL CATEGORIES</b>	<ul style="list-style-type: none"><li>• Business and administration professionals</li><li>• Science and engineering professionals</li><li>• Information and communications technology professionals</li><li>• Business and administration associate professionals</li></ul>

Source: ManpowerGroup analysis of Gartner & TalentNeuron findings

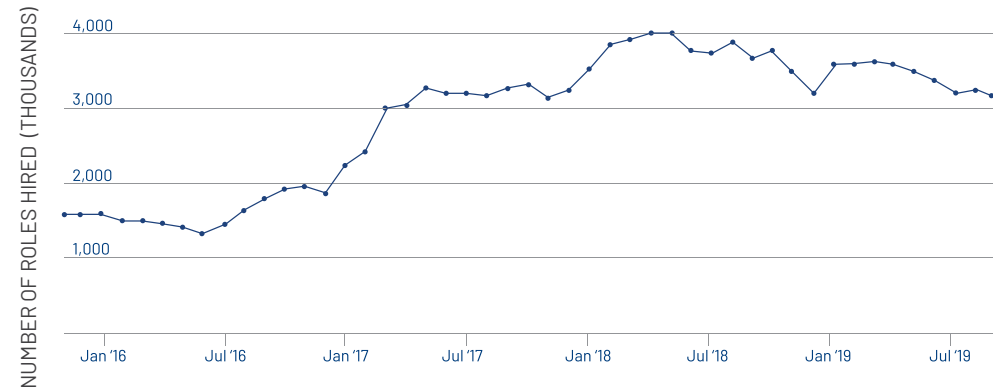
# Digital talent is in demand across all industries

## AREAS OF HIGHEST COMPETITION AND TALENT SHORTAGE

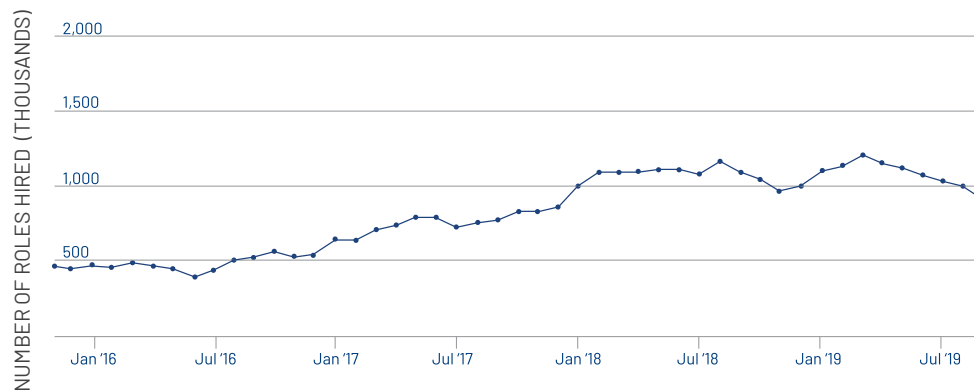
### AUTOMATION OCCUPATIONS



### ENGINEERING OCCUPATIONS



### TECHNOLOGY DESIGN OCCUPATIONS



# 95%

of candidates a mining company would seek to hire are currently employed or engaged elsewhere, with record high employment rates in the U.S.

Source: ManpowerGroup analysis of Gartner & TalentNeuron findings



# The connected mine and the **connected workforce**

Rockwell Automation recently conducted a market study on digitization in the mining industry: **At a Crossroads: The Connected Mine Evolution**. The study examined the current state of technology adoption in the industry. A main finding was that while mine executives readily identify their priorities, progress made to date is less mature than in other industries surveyed. In fact, most mines are in the pre-implementation phase of their journey, with nearly one third still in the initial exploration and fact-finding stage.

New technology, improved data management and analysis, along with the continued automation of mining operations, requires change: process change, people change and organizational change during all levels of digital adoption.

OF THOSE SURVEYED:

**63%**

noted they struggle to integrate data across multiple systems

**39%**

reported challenges with integrating legacy equipment

**38%**

said lack of employee skills is a key digital transformation challenge

Source: Rockwell Automation Study; At a Crossroads: the connected mine evolution

## GRADE 1:

1000 points of light



## GRADE 2:

Digital is a differentiator

Digital strategies are emerging in silos across the company as division recognize and respond to signs of digital change

## GRADE 3:

Digital is table stakes

Digital strategy is embedded within the enterprise strategy, with an inherent willingness to disrupt your core business

Compared to other industries, Mining is low on the digital disruption curve. Source: Bain & Co

# Mining employer attitudes toward digital transformation

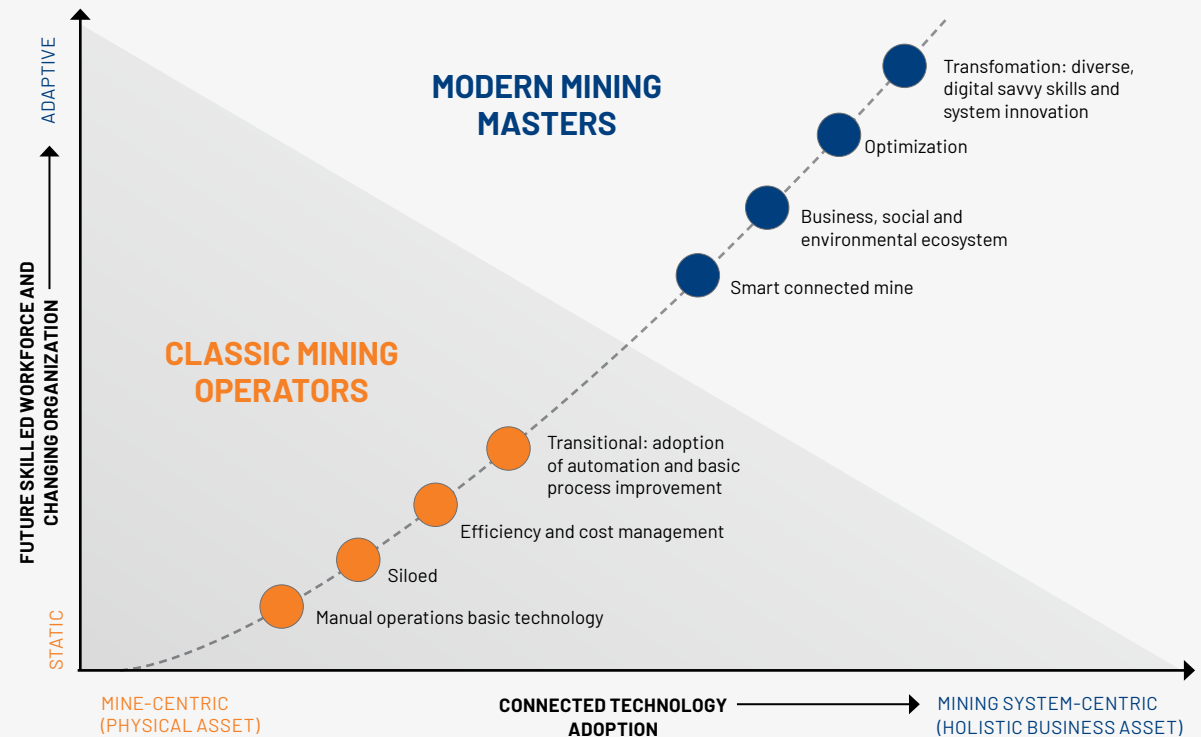
Workforce strategies vary at different points of technology adoption. And the pace and attitude towards digital transformation drives today's talent strategies.

## MODERN MINING MASTERS

are open to the benefits of digital technology and interested in investing, often proactively, in employees with the skills needed to thrive in the connected mine environment.

## CLASSIC MINING OPERATORS

are more apprehensive toward technology adoption, and tend to seek employees with a more traditional mining skillset.



Source: ManpowerGroup



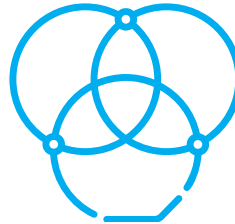
# Mining employer spectrum: business characteristics



## CLASSIC MINING OPERATORS

Companies cautious about change and innovation; seek employees with a traditional skillset

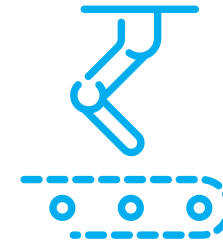
- Resistant to create early-stage digital mining vision, strategy and business case
- Operate aging or unsophisticated infrastructure
- Have less structure, which enables attitudes of willingness to break rules or make new rules
- Implement some courageous modernization sponsors and early tech wins, but slow to get traction or fully scale
- Connect/automate in some operational areas but do not connect end-to-end or across process
- Have operationally siloed assets and information; require increased and shared visibility
- Rely strongly on on-site management, assets and discrete systems
- Overall, likely have longer cycle times for optimizing assets and operations



## SHARED TRAITS

Factors shared by most mining companies

- Operate in a business world with overarching priorities: efficiency, safety, cost, community
- Address wide groups of stakeholders, demanding continuous improvement, social responsibility and innovations
- Encounter increased issues for securing a 'license to operate' on a local, national or global scale
- See trending opportunities for green mining and circular mining economies
- Experience lower public/governmental mining R&D investment and more private/vendor investment and partnership
- Must work past 'boom-bust commodities industry' mindset to a more proactive mindset
- Must move from 'mine as a physical asset' mentality to 'mining as a whole system' mentality



## MODERN MINING MASTERS

Companies willing to take risks to use emergent technologies; seek employees with broader and newer skillset

- Achieve early adoption and integration wins and move on to continuous digital-era transformation
- Produce proof of prior digital transformation success, yet are required to show new and ongoing ROI
- Have better methods to understand ROI of digital initiatives (including cost avoidance)
- Experience demand for digital capability and business cases to support the value brought by digital
- Move from successful intra-function connectivity to inter-functional and cross-functional digital connectivity
- Move from individual asset management to 'pit-to-port' visibility
- Optimize increasingly varied supply chains and business ecosystems
- Scale and share wins while maintaining local operating assets and goals
- Seek established technological leadership/ industrial R&D in-house or more often with vendors and partners
- Look for roles that can scale and continuously innovate to maintain and enhance ongoing execution

BUSINESS STATUS

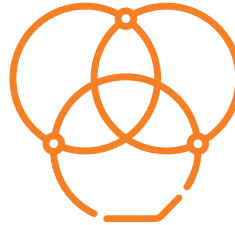
# Mining employer spectrum: workforce characteristics



## CLASSIC MINING OPERATORS

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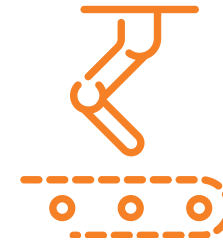
- Rely on assumptions of older 'only game in town' employment value
- Offer less employment value proposition for in-demand talent; struggle to prove to new talent pools that they can be a destination employer
- Risk losing the better/more advanced talent they do have to competitors or other industries
- Lack workforce readiness—employees may have resistant attitudes toward change and lower capabilities
- Have risk-averse or resource-constrained business leaders
- Require guidance on how to build/buy/borrow initial pivotal digital workforce
- Lose large numbers of employees to boom-bust cycles
- Believe that a good paycheck is enough to attract and keep talent



## SHARED TRAITS

Factors shared by most mining companies

- Experience changing workforce demographics
- Increasingly need to meet modern talent demands
- Must replace retiring employees and attract new 'digitally native' generations
- Operate in an industry with mixed reputations and public relations challenges to younger, new employees
- See increasing pressures from geo-political factors
- Suffer from waning participation in training and education in many global regions



## MODERN MINING MASTERS

Companies willing to take risks to use emergent technologies; seek employees with broader and newer skillset

- Compete for a higher percentage of their workforce, especially the same STEM and digital savvy talent, with industries outside of mining
- Seek employees who go beyond the mechanics of automating, who can focus on innovating and optimizing
- Address many specific areas of reskilling (for example, digital operations, controls and maintenance)
- Commit to employee career development: continuous hardware and software upgrades require changing digital capabilities and tools
- Manage a change-weary workforce who has gone through prior tech upgrades
- Offer improved employment value proposition: the more automated the company operations, the greater need for educated/trained workforce and higher wages
- Offer new career paths resulting from merging digitally-enabled capabilities with core mining expertise

### WORKFORCE STATUS





## PART 2

# what's shaping the workforce?

Where are we now?  
PG 3

**What's shaping  
the workforce**  
PG 15

Emerging career  
opportunities  
PG 22

How to attract  
the best talent  
PG 32

Summary  
PG 38

# Automation

Developing a strategic plan for automating some tasks, updating what we expect from employees, and providing appropriate employee training will be key to employer success.

A key determinant of automation is the level of routineness for a task. Other considerations include:

- Costs to automate
- Scarcity of employee skills
- Cost of employee labor
- Regulatory and social-acceptance considerations
- Safety

**Automation brings opportunity** to find efficiencies, grow the bottom line, and remove employees from physically burdensome or unsafe roles. As tasks across a mine become automated, employee skills, job descriptions, and the way work is distributed must evolve.

## AUTOMATION IS REPLACING ROUTINE WORK

Automation is replacing as much as

**45%**

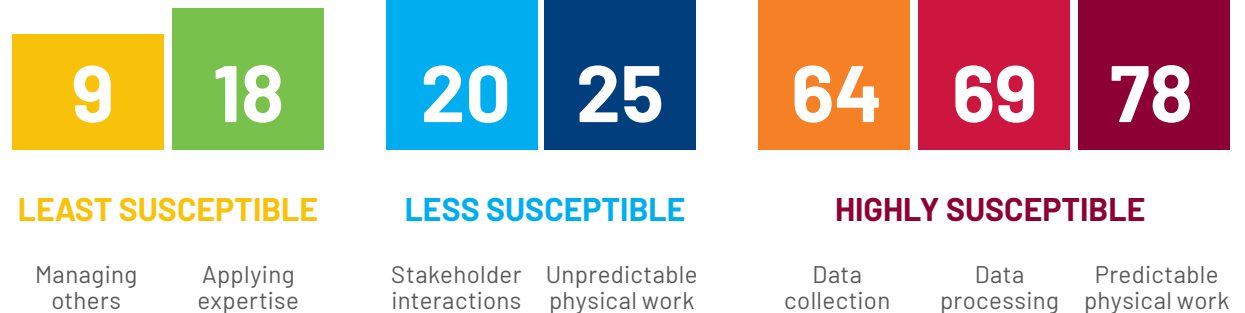
of activities employees perform

but fewer than

**5%**

of total occupations

**Technical feasibility**, % of time spent on activities that can be automated by adapting currently demonstrated technology



Source: McKinsey; Jobs Lost, Jobs Gained Report



# Employee expectations

## NEW WORK STRUCTURE OPTIONS

Employees want more considerations in where, how and what type of work to do:

- Gig versus full-time
- Mobile/virtual versus centralized or remote
- Contractor versus employees

## DEMOGRAPHICS/TALENT MANAGEMENT

Diversity in a workforce breeds creativity and leads to profitability. Four talent pool attributes—gender, race, education and generation—need to be grown in the future mining workforce:

- Mining is missing women and people of color: in the US only 6% of coal miners are women; globally mining's workforce is 90% male and 83% are Caucasian.
- Mining education programs around the world are shrinking both in enrollment and in program scope.
- Younger candidates who possess many of the skills and perspectives that can update the industry may be reluctant to accept certain mining work conditions.



**6%**  
of US coal miners  
are women; globally  
mining's workforce  
is 90% male and 83%  
are Caucasian.

Source: World Statistics on Mining and Utilities Report



# Boom-bust commodity cycles

**Business cycles have a direct impact on the workforce**, and the boom-bust cycles in mining have historically meant a loss of good labor that will likely not return. We know boom-bust cycles won't stop happening, but employers can start to better predict and respond to these cycles.

**To address the ebbs and flows of talent** and the changes to supply and demand of the workforce that accompanies boom-bust cycles, mining companies need to adopt a longer term and more responsive set of strategies. These enable them to adjust their workforces in more viable ways with less damage to their employment brands or pressure on local economies.

**Advanced talent planning and skill development strategies** can alleviate some of the impacts of the boom-bust cycles. Various forms of strategic staffing, staged workforce development, special assignment management, and retention strategies can also help a mine operate in a way that's more stable, despite the cyclical workforce challenges.

## IS THIS TIME DIFFERENT?

At no time in the last 200 years have commodity prices risen as fast and as high as in the last decade without sharp decline



Source: University of Queensland study

# Evolving customer expectations demand new skills from workers



## TRANSPARENCY

Digital-era mining customers—the public and communities where mines operate—have more access to business, regulatory and consumer information than ever before, and demand high degrees of transparency.

## SPEED

Organizations are also struggling with fast-moving customer demand, changing material expectations and the need to adopt more rapid cycles of innovation to stay ahead of competitors and deliver growth and market retention.

## SUSTAINABILITY

The influence from consumers also includes continuing environmental and corporate social responsibility pressures.

# Digital transformation

The continued use of digital technology in mining will take companies from 'now' to 'next'.  
As this transition occurs, employee skillsets will need to evolve.

## now

Organizational silos with inefficient decision-making

Disconnected physical assets

Ineffective supply chain management

Lag between supply and demand

Downtime

Excess waste

## next

Digitally synchronized operations with data and model-based decision making

Assets talk, predict, and auto-correct

Integrated supply chain network

Supply and demand synchronize

Predictive and prescriptive maintenance

Zero to minimal waste



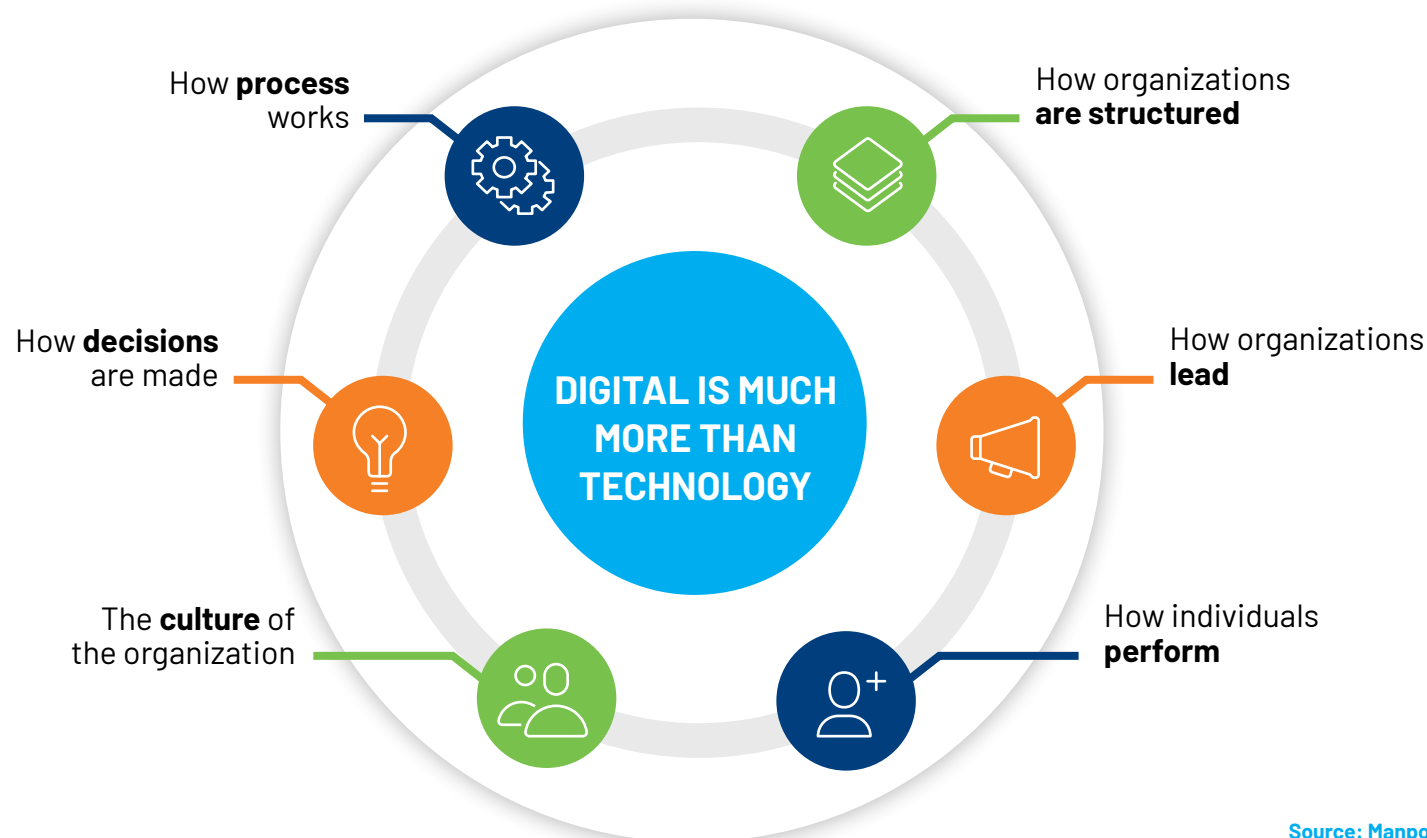
# The need for innovation goes beyond gadgets

## INNOVATION FOR SUCCESS

Adapting to changing ore grades, meeting increased consumer demand, improving resource management—the mining industry is facing uncharted territory, and innovation will be required for success. The skill sets for innovation are a requirement for the workforce, management styles, and company culture.

## CLASSIC VS MODERN MINING

One of the biggest differences between the classic mining companies and the modern mining companies is not just how much technology they have implemented but, even more importantly, how well they have made and driven organizational change to enable innovation.



Source: ManpowerGroup



# **PART 3**

# **emerging career opportunities**

Where are we now?  
PG 3

What's shaping  
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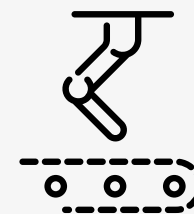
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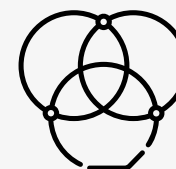
Summary  
PG 38



# Mining roles are evolving in light of digitization



Today's remote operators and maintenance mechanics now have a focus on automation, instrumentation and control systems as much as hauling and transport.



Multi-skilled engineers are combining mechanical engineering, electrical engineering and computer engineering skills into one role.



Multi-skilled scientists are combining domains like geology, environmental science, and economic geology to create roles like the environmental accountant.



# Evolving roles

These are some of the biggest shifts we've seen to date, but there are many more role changes on the horizon as mining companies adopt more and more digital technology.

Common role evolution in the mining industry

## From conventional role to digital era role

### DRIVERS

MAINTENANCE MECHANIC

CHIEF INFORMATION OFFICER

ENVIRONMENTAL SERVICES MANAGER

### REMOTE OPERATORS

PREDICTIVE MAINTENANCE SPECIALIST

CHIEF DIGITAL OFFICER

ENVIRONMENTAL ACCOUNTANT

# Great opportunities are on the horizon

as mining becomes more integrated with technology

## CAPABILITIES

## POTENTIAL NEW ROLES

### Data analytics/data science

- Data analyst
- Engineering manager, data and analytics
- Data scientist
- Chief data officer

### AI machine learning, cognitive technologies

- Machine learning specialist
- AI trainer or tester

### Robotics and assistive technologies

- Assistive technologies (VR/AR) system specialist
- Robotics engineer
- Mechatronics engineer
- Control systems designer
- Field applications engineer
- Multi-skilled reliability maintenance technician

### IT/OT and advanced automation

- IT/OT systems engineer
- Process quality data analyst
- Autonomous vehicle systems engineer

### Cybersecurity, data security and integrated risk mitigation

- Security systems technician
- Cybersecurity analyst
- Cybersecurity strategist
- Cybersecurity architect
- Incident response investigator
- Risk mitigation and crisis management director

### UI/UX design

- Worker experience designer
- User experience architect
- Design thinking facilitator

# Great opportunities are on the horizon

as mining becomes more integrated with technology (*cont.*)

## CAPABILITIES

## POTENTIAL NEW ROLES

### Remote operations and innovations

- Process simulation specialist
- Automation and controls engineer
- Vendor/OEM collaboration manager
- Automation manager—retro fit

### Mobile equipment operations

- Remote operations center controller
- Drone pilot
- Mobile equipment operator
- Predictive maintenance specialist
- Electromechanical technician
- Multi-skilled operator
- Autonomous haulage specialist

### Integration and innovation leadership

- Integration program manager
- Chief advisor, process control
- Fleet asset optimization engineer
- Innovation strategist
- Chief digital officer
- Transformation principal/executive

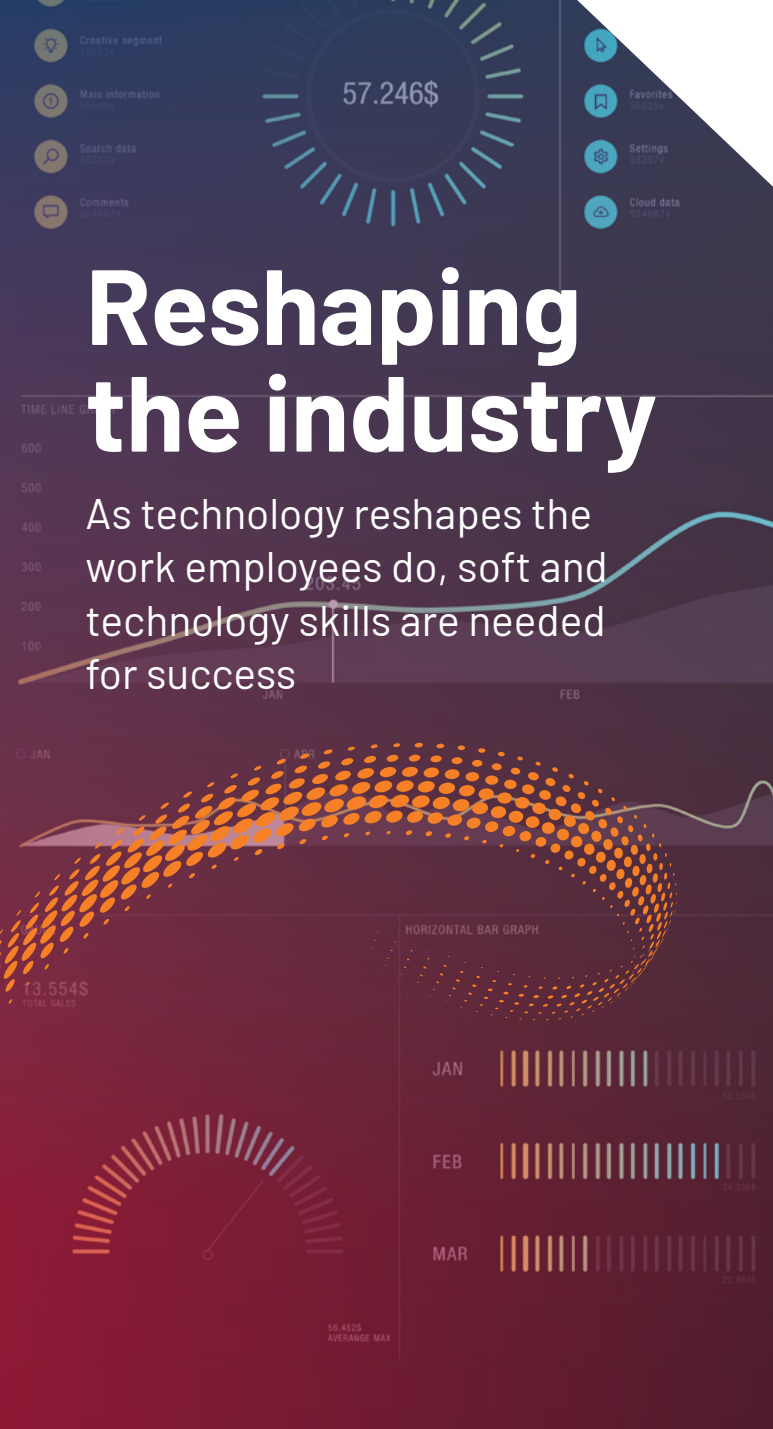
### Energy, environmental management and biomimicry

- Environmental technician
- Bio-mining specialist
- Bio-mining scientist
- Biologist
- Environmental accountant
- Biomimicry and sustainability specialist
- Reclamation and remediation specialist

### Employee and community stewardship

- Regional community network coordinator
- Organizational change strategist
- Regulatory and compliance manager





Strategies like 'effective' or 'efficient' along with 'more at any cost' are not producing results. Optimization is expected from most job assignments and activities. Optimizing looks to obtain the best performance achievable considering the constraints, with strategies that maximize desired factors and minimize undesired ones. This means even more factors and variables need to be considered and dependencies weighed.



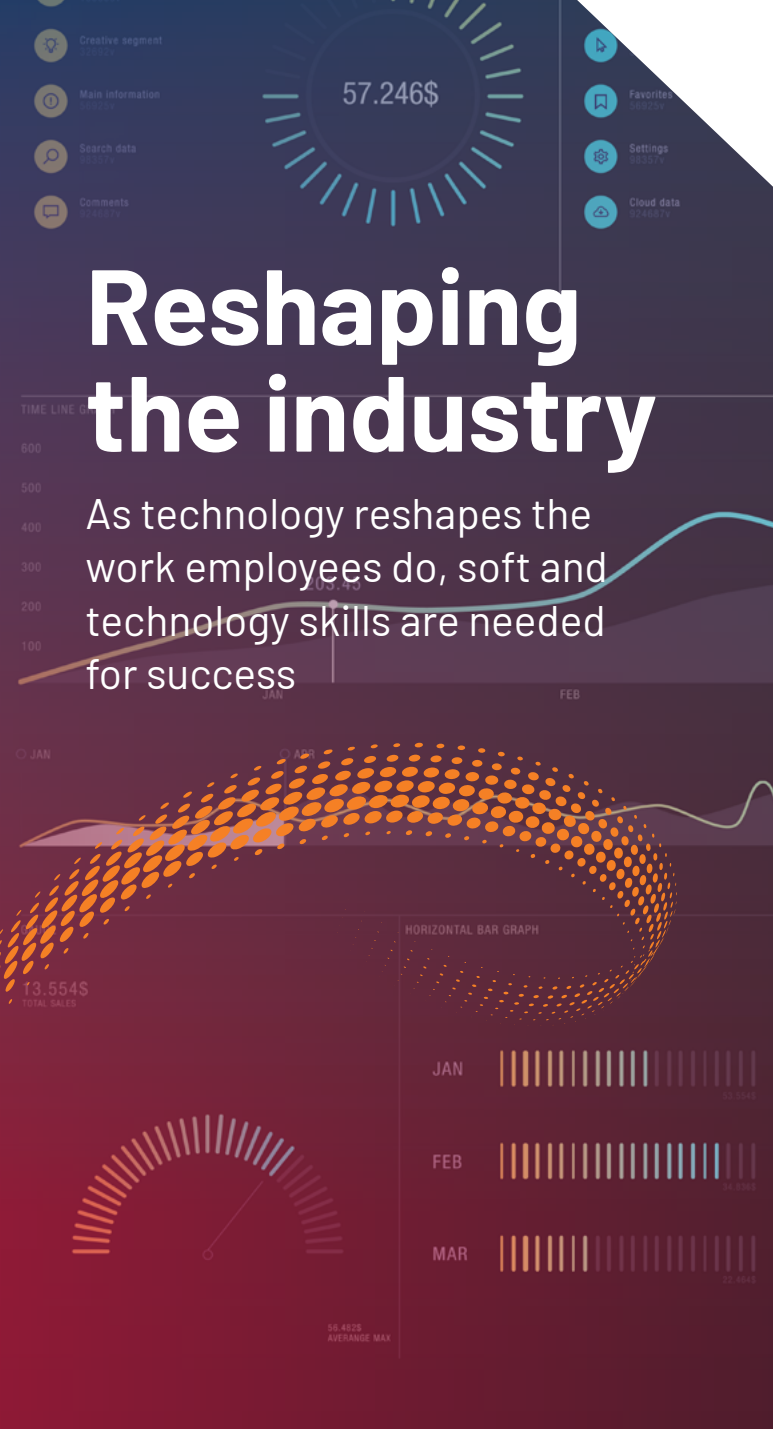
Teams and stakeholders make work more integrative and involve cross-functional processes for most roles. Collaboration has never been more in demand. Work takes place well beyond the borders and boundaries of the past; mobile, virtual and remote work practices expand options for safe and cost-effective activities.



With the explosion of available data and information, most roles are more quantitative and evidence-based and require working with more data. Characteristics like an increase in math aptitude or comfort working with statistics has become increasingly sought-after in all roles.



Technology-assisted work is now more common than not; desktop software, process automation and virtual reality are commonly used in all roles. From cobots to robots, remote operations and connected systems, both the software and hardware used by most employees continues to involve more advanced technologies.



Today's connected mining environment shows that mining companies are not an island. They operate with many essential partners, and are increasingly dependent on their network. As in other industries, digital era connectivity established that it will be harder to be successful as a lone player.



Being about 'the mission' is of increasing interest to many. Mining has a chance to advance and improve their mission orientation including sustainability and community inclusion, over the legacy views of mining. Leaders and job designers are keen to position each role as part of a broader and better mission and work to address more equitably the interests of a broader group of stakeholders. This helps address the major challenge to secure a license to operate.



Across the lifecycle, everyone has a role in being a 'sales person', representing the company as best as possible while also looking for innovation and creating commercial value.



Expanded and continuing sustainability expectations from stakeholders change the lens of solutions internally and externally, especially when accompanied by formal legislation. Each role can contribute to sustainability and achieve ecological, brand and community capital goals.

# Evolving role example 1:

## Vendor/OEM Collaboration Manager

The Vendor/OEM Collaboration Manager handles integration efforts and works with the external resources on behalf of the internal resources and stakeholders, staying on point to increase the success of new technology that is adopted.

### WHO CAN WE SEE INTERESTED IN AND SUCCEEDING IN THIS ROLE?

- With the right development opportunities, Vendor/OEM Collaboration Manager could be a career progression for drivers/machine operators, plant operators, engineers or others with mining process aptitude and an internal/external attitude.

### HIGHLIGHTS:

Sourcing this role from internal candidates will be essential, as these employees must bring expertise in the core operations/processing functions and often deep machine or process level knowledge. Internal candidates would have existing relationships and organizational context to represent the interests and unique needs of the company.

Development will be necessary. Candidates will need strong project management skills, an ability to influence change without direct management, change management skills, and an understanding of the work that needs to be done to integrate with existing solutions.

Rotating on site and remote experiences will be important so any remote-related roles and innovations have exposure and appreciation for the physical and mechanical states at the processing and plant level. Keeping broad relationships to understand the operations community overall will provide the best representation with vendors and improve shared integration success.

## Vendor/OEM Collaboration Manager (Haulage)

"My experiences as a driver at the mine make me a perfect partner with our mobile equipment vendors when they bring us the latest and greatest. Together we integrate new methods, equipment and systems. My focus is on optimizing operational efficiency and bringing our team up to speed on new tech and processes."



# Evolving role example 2:

## Environmental Accountant

The Environmental Accountant examines how mining companies are performing against a set of measures, delivers on regulation reporting requirements, and helps increase transparency using measured data to meet stakeholder expectations. This role also grasps the financial impact (short/long term) of implementing the best environmental practices, as well as the opportunity cost of not implementing them.

### WHO CAN WE SEE INTERESTED IN AND SUCCEEDING IN THIS ROLE?

- Environmental-related technicians or engineers or other business professionals with environmental and social interests aptitude and a systemic business/stakeholder and finance orientation would fit nicely in this position.
- Analytical yet creative problem-solving types, holistic, fair-minded perspectives with broad business and mine lifecycle knowledge would be valued highly for this role.
- An ability to collaborate will be key, as this role will be critical to helping other innovation and bio-eco roles build holistic business cases for change.

### HIGHLIGHTS:

- Social license to operate is critical to the success of a mine. This position helps businesses lead with environmental accountability and stay on top of EHS compliance.
- Employees who seek a sense of purpose or connection to the mission will relish this role, as it will provide a direct line to driving business improvements that not only impact the company, but impact the community and the environment.

## Environmental Accountant

"Part finance professional and part environmental analyst, I influence our company's eco policies and financial goals —ensuring our prosperity doesn't come at too high a cost to the environment. I do cost benefit studies that include considerations from exploration all the way to remediation. My goal is to assess impacts of our choices, maintain our certifications, help brainstorm improvements, and consult on best practices that are cost-effective and meet all stakeholder interests."





# Evolving role example 3:

## Cybersecurity Investigator

The Cybersecurity Investigator assesses and addresses data breaches and improves methods for securing data, systems and assets. With a rapid response and recovery time from threats and breaches, this role also interacts with forensics and other security, law enforcement and regulatory parties as they design approaches, assess vulnerabilities, and build and monitor protective systems.

### WHO CAN WE SEE INTERESTED IN AND SUCCEEDING IN THIS ROLE?

- The role can be a progression for internal security technicians, testers, administrators and developers or it can be an outside professional with law enforcement and information security program experience. Either way, development will be needed, generically for cybersecurity tools and methods and then to understand the mining company's vulnerabilities.
- Areas of skill and capability include: forensic sciences and increasingly digital specific forensics; law and investigation; analytical skills; attention to detail; and sufficient technical and cyber system skills to access monitoring systems, especially for evidence gathering and audit compliance. A formal law or legal background is not a requirement.

### HIGHLIGHTS:

- Autonomous mining investments add more access points across the lifecycle and insert a new level of connected technologies and data transmission to the corporate network. Understanding risk exposure and how to quickly respond is part of the investment needed to be made in the digital era.
- Cybersecurity best practices evolve rapidly. Employees who enjoy personal growth and opportunities to learn and develop new skills and areas of expertise will enjoy this role.

## Cybersecurity Investigator

"Part business analyst and part technologist, I'm a super-sleuth who investigates threats, incidents, and breaches across our mining networks, systems and assets. I work with colleagues and authorities to fix, report and learn from the experience. More and more aspects of our operations are becoming digital, and I serve as the bridge between our operations team and our IT team. Keeping our vulnerabilities low and our cybersecurity high is my goal."



The background image shows two industrial workers in the foreground, wearing yellow and white hard hats and dark work clothes. They are standing on a metal platform or walkway, looking out over a vast, hazy industrial landscape. The sky is a mix of blue and orange, suggesting a sunrise or sunset. The scene is dominated by large, dark, curved structures, possibly parts of a large machine or a ship's hull, which frame the view. The overall tone is professional and industrial.

# **PART 4** how to attract the best talent

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# Employment value proposition

Within an industry, employers have always competed for talent. However, we're seeing this competition broaden in the digital age because the skills employees need to succeed are often very similar across industries. In order to secure quality talent, the mining industry needs to update its employment value proposition (EVP).

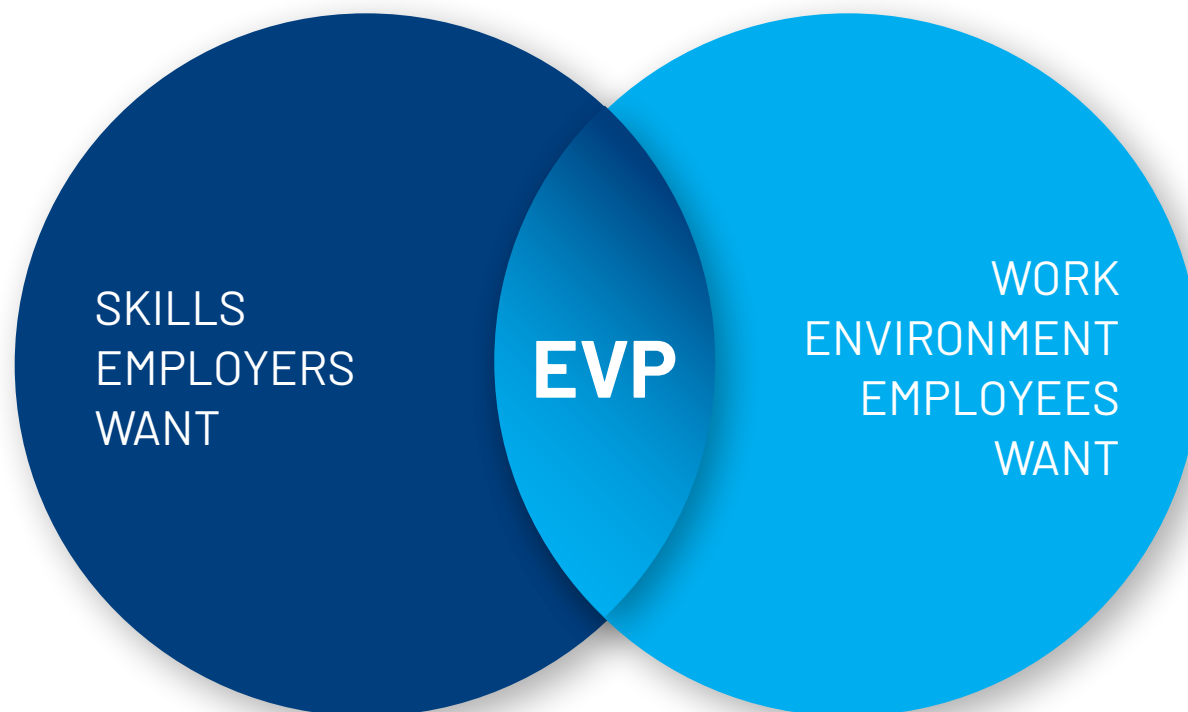
EVP is not just human resource hype. Organizations with attractive EVPs can reduce the compensation premium needed to attract qualified candidates as well as potentially decrease annual employee turnover by nearly 70%.

Source: Gartner

## The EVP is an exchange

**The employer** offers a work environment including pay, benefits, culture and opportunity that is valued by the employee.

**The employee** brings valued skills, experience and work ethic that the employer needs.



Source: ManpowerGroup



# What skills are employers seeking?

Mining employers are seeking many of the same digital skills that are valued in other industries. This desired general skill set combines business domains, technical and science areas, and interpersonal (soft skills) capabilities.

## BUSINESS

- New value creation
- Optimization
- Business transformation
- Stakeholder management
- Change management

## TECHNICAL

- AI and machine learning
- Big data and analytics
- Integrated operations architecture
- Autonomous systems
- Eco and bio sciences

## SOFT SKILLS

- Critical thinking
- Creativity
- Collaboration
- Problem solving
- Adaptability



# How can mining employers find talent?

## VARIED SOLUTIONS HELP NAVIGATE TRANSFORMATION



### **BUILD**

**Invest in learning and development to grow your talent pipeline**

Build strategies are often the first strategies companies look to for navigating workforce transformation.

Classic mining companies will have fewer digitally literate employees to upskill. These companies will need to seek out employees with soft skills like a willingness to learn, adaptability, and big-picture thinking—and then provide training on digital skills.

Modern mining masters will have a larger pool of digitally literate employees to pull from. These companies can focus on developing digital leaders within the organization.

Identifying future potential, driving a culture of learnability through the organization, and providing accelerated training programs will be critical to success in the digital age.



### **BUY**

**Look outside the company for talent**

Many of the roles mining companies are seeking are built on skills that are transferable across industries.

Classic mining companies may find a buy strategy serves them well as they seek to develop a base of employees with digital skills that can serve as leaders.

Modern mining companies can use a buy strategy to fill niche roles that require cross-discipline expertise and experience.

All mining companies will need to be cognizant of the employee value proposition they are putting forward when they seek talent from other industries that may, on the surface, seem more attractive.

Source: ManpowerGroup Talent Shortage Study

# How can mining employers find talent?

## VARIED SOLUTIONS HELP NAVIGATE TRANSFORMATION



### **BORROW**

**Leverage outside talent communities like freelancers, contract employees, and temporary workers**

Contract and temporary workers have been used for a long time to serve the mining industry. Both classic and modern mining companies often have alternative work sources defined already, but typically use these sources to fill only specific, on-site roles. By widening the skills they seek from these outside communities, mining companies will expand their ability to fill gaps.

Freelancers and contract employees can bring valuable digital expertise or business skills. These employees tend to have experience working remotely, which can give them the potential to contribute to multiple mine sites at a time. New job infrastructure may be needed to accommodate remote talent, but it opens doors for added productivity.



### **BRIDGE**

**Create a proactive and smooth relocation plan for individuals not adapted to the new organizational strategy or required competencies**

Transformation, digitization, and automation have created a skills revolution where new skills emerge as fast as others become obsolete. Leaders have a critical job of optimizing the skills they have in their workforce and finding alternate pathways for those whose skills are no longer a fit. Consulting companies are a great resource for helping employers and employees with the process of finding another occupation that leverages the employee's skills and experience—enabling them to thrive in another market.

Source: ManpowerGroup Talent Shortage Study

# Know your strengths

## WHAT WILL EMPLOYEES LIKE ABOUT THE MINING WORK ENVIRONMENT?

1

**Game-changing:** The scope and impact of being involved with game-changing digital transformation is appealing to candidates. Many of today's top talent want to work in an industry where they can advance operational, environmental and technical goals and be mission-focused.

2

**Digital advancement:** With increasing connectivity and smart mining improvements, mining is a great place to gain digital experience and learn how to apply many of today's leading technologies and sciences.

3

**Variety:** Mining has many functions. Evolving operational and processing roles, hybridized engineering roles and disciplines, stakeholder and supply chain coordination, and leadership offer something for most everyone. From technicians to drivers to accountants to drone pilots to community advocates and even space and ocean miners, mining's work scope continues to grow.

4

**Holistic:** The expanded lifecycle of mining—from early exploration to reclamation—and the opportunity to work with increasingly broader groups of stakeholders is attractive for many candidates.

5

**High paying:** Mining in many instances will be one of the better paying industries of the future. It often offers and maintains pay advantages to offset some of the work-life impacts that site locations or travel-based work dictates.

6

**Eco-Bio-Environmental:** Innovative mining companies are expanding the science domains used for improvements, innovations, and addressing declining ore grades and alternative sourcing strategies. Sustainability and community relations agendas are also very appealing to mission-focused candidates.

7

**Operational excellence:** For those who want to design and deploy modern improvement solutions that go beyond the basics of efficiency and effectiveness, mining is a great destination. Mining is highly focused on continuously achieving optimization even as dynamic factors change conditions, and not just focus on cost reductions or routine productivity.

8

**Career advancement:** There will be gaps in leadership due to the retirement of older mining cohorts. Millennials are no longer the newest workforce pool, but they are the largest; just as importantly they are now many of the hiring managers in mining. Established mining leadership and HR functions need to support them in their recruiting and management of younger and even more digitally native employees.

9

**Safe, flexible, balanced:** Mining has continued its focus on increasing safety, an area helped by aspects of technology but still a major performance and risk area, especially in certain less regulated or modernized operations. The flexibility in work formats by creating new approaches to workforce management allow for better work-life balance.





# PART 5 summary

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# Key takeaways

## WHERE ARE WE NOW?

In a [2020 EY survey](#), mining employers ranked their top risks and opportunities. 'Future Workforce' came in at #2, and 'Digital and Data Effectiveness' at #3. These two risks/opportunities go hand in hand: the changes needed to undergo digital transformation must be designed and led by a digitally-literate workforce.

## WHAT'S SHAPING THE WORKFORCE?

Today's workers expect different things out of their employers. They seek flexible work structures, better work/life balance, and an increased sense of purpose. In addition, the education today's workers receive focuses less on traditional skills, and more on digital literacy and soft skills like change management and collaboration.

On top of changing workforce dynamics, mining employers are also facing a challenging business environment: ore grades are declining, and demand for traditional and new materials is on the rise. Innovation will be needed for companies to stay afloat, and this includes more automation and digital transformation projects, for which digitally literate employees are necessary.

## EMERGING CAREER OPPORTUNITIES

Mining career opportunities are evolving in light of digitization. More and more job paths require digital literacy and soft skills like collaboration, communication, and change management. Additionally, we're seeing a growth in multi-discipline roles: where the employee brings skills that span multiple engineering, science, and/or business domains.

## HOW TO MODERNIZE YOUR WORKFORCE

Companies across industries are competing for the same talent, and mining employers must be intentional about designing their employment value proposition (EVP). The EVP is an exchange: the worker skills and experience an employer wants for the workplace environment the employee seeks. Every organization has the opportunity to build and market a unique EVP to attract and retain the employees they need to push forward digital initiatives and drive innovation.





Growing a workforce is more than just updating hiring practices. Through a combination of build, buy and borrow strategies, employers can gain new employees, groom others for advancement in the company, and cover gaps that may arise with market cycles.

### About Rockwell Automation

Rockwell Automation Inc. (NYSE: ROK), the world's largest company dedicated to industrial automation and information, makes its customers more productive and the world more sustainable. Headquartered in Milwaukee, Wis., Rockwell Automation employs approximately 23,000 people serving customers in more than 80 countries.

### About ManpowerGroup

ManpowerGroup® (NYSE: MAN), the leading global workforce solutions company, helps organizations transform in a fast-changing world of work by sourcing, assessing, developing and managing the talent that enables them to win. We develop innovative solutions for hundreds of thousands of organizations every year, providing them with skilled talent while finding meaningful, sustainable employment for millions of people across a wide range of industries and skills. Our expert family of brands – Manpower, Experis and Talent Solutions – creates substantially more value for candidates and clients across 80 countries and territories and has done so for over 70 years.

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