

SAFEGUARDING KNOWHOW

How technology
is shaping our
future workforce

It is important to break down gender barriers before young women make decisions about their future career paths
Photo courtesy of Sandfire Resources



At present, innovation is the word on everybody's lips. From the Prime Minister of Australia to industry bodies, consulting firms, manufacturers, service providers and major mining and energy players – everybody is talking about it, and everybody wants in.

The global economy is in the early stages of what is commonly referred to as 'Industry 4.0'. The connotation is that we are entering the fourth industrial revolution driven by automation and data exchange in manufacturing processes, and it is underpinned by technologies such as cloud computing and cyber-physical systems.

So what does this mean for the resources industry?

With our industry coming off a long period of high commodity prices and demand, there is no doubt that resource employers of all shapes and sizes are sitting up and paying attention to the rapid application, sophistication and deployment of innovative work practices, techniques and technologies.

As the 'people specialists' for Australia's resources industry and the national employer group, AMMA is often asked about the emergence of our mining equipment, technology and services (METS) sector and, in particular, what it means for the future of our workforces and working practices.

The critical point is that the greater uptake in technologies like automation, drones and remote operating will not reduce the importance of the 'human side' of our industry. It will, however, change and evolve the type of roles, skills and work practices that our industry deploys.

The innovators

To better understand how the 'people side' of our industry will be impacted by innovation, we should explore a few examples of how emerging, cutting-edge technologies are improving the way we work.

One of the more active providers of innovation to Australia's resources industry is CRC Mining – an industry-run research centre working from the University of Queensland.

CRC Mining's technology is promising because each and every area of research, no matter what size or level of investment, is developed to match specific operational, safety and productivity priorities of their funding partners – a 'who's who' list of globally diversified resources companies. This ensures new technologies can be commercialised and adopted into the mining supply chain much faster than the current average of 15 years.

One great example of how technology is improving safety is

Australia's resources industry is entering an exciting new era where traditional manual labour is making way for remote operating centres, automation, robotics, fibre optic sensors and other technological advances that will ensure the new generation of miners are working smarter. As 'people experts' for the industry, the Australian Mines and Metals Association (AMMA) understands the unique challenges facing this highly diverse sector. In this article, Executive Director of Industry Services Tara Diamond considers the workforce impacts of the 'innovation agenda', and how the employer group is assisting with future skills development.



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CRC Mining's innovative SmartCap monitoring solution. This technology is essentially a baseball-style cap that, when worn by truck drivers and other operators, electronically monitors their brainwaves to allow for continuous fatigue management. By providing operators with information about when and how they get tired, they can make changes to their lifestyle and sleeping habits to ensure they are more alert, safer and more productive at work.

Another breakthrough solution that has the potential to revolutionise safety in underground mining is oscillating disc-cutting technology. By employing a new method for cutting hard rock using lower forces than conventional cutting, this technology could see drill and blast processes replaced with a continuous mining process, and humans can be removed entirely from harm's way.

Of course, CRC Mining is not the only research centre driving innovation in our industry.

Austrmine, the peak representative for Australia's METS providers, notes that Australia is a global leader for METS innovation, particularly for the resources industry.

The organisation's Chief Executive Christine Gibbs Stewart believes that just as New York is the finance capital of the world and Paris is the fashion capital – Australia is increasingly being recognised as the innovation capital of the world.

Government is also getting on board. For instance, the Australian and Queensland governments have committed to fostering innovation through collaboration, and have launched a Mining, Equipment, Technology and Services (METS) Growth Centre in Brisbane. The centre will focus on improving coordination between researchers, investors, mine operators and the mining technology and service sectors to bring new innovations to market.



CRC Mining's SmartCap fatigue management is one of many new technologies improving safety in mining

Building our future skills base

Due to our industry's appetite for new technologies, the skills required to work in Australia's resources sector are changing rapidly and quite dramatically.

The future 'mine worker' will soon be replacing their tools and shovels for skills in data analysis, remote operating and advanced computing. Creating a framework to develop these skills is proving just as important as the technology itself.

This is where AMMA is working closely with government and industry stakeholders on several fronts. For instance, I have been a member of the Australian government's five-person vocational education and training (VET) advisory board since 2014. The board is working to ensure Australia's VET system is responsive to the new skills required to keep pace with innovations being delivered within the resources industry.

We are also working to overcome existing vocational skills

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and training challenges by implementing options to better align regulation with the VET outcomes required for our industry's future.

Another way in which AMMA is helping foster the future skilled workforce is through directly promoting science, technology, engineering and maths (STEM) careers to school-aged children.

In 2016 we hosted our pilot *Resource Kids Connect* event, which saw more than 240 West Australian primary school students get a taste for technology-based careers in the mining, oil and gas industries. This is an industry initiative that delivers on the national STEM School Education Strategy, as well as the Council of Australian Government Education Council's plan for renewing focus on STEM subjects in all Australian schools.

The pilot event drew students from four Perth schools, and we teamed up with some of the country's best mining and engineering companies in Fortescue Metals Group, Thiess, Monadelphous and Georgiou Group. Students had the opportunity to learn about the different jobs in our industry and engage in interactive, hands-on activities.

Women working across geology, engineering and other operational roles also provided 'role model' presentations to show female students in particular that women can succeed in what has previously been viewed as male-dominated careers.

Women comprise just 13.7% of the national resources industry workforce, and very few of these women work in site-based operational roles. While resource employers are actively working to attract and retain more women, it is critical to break down gender barriers and stereotypes before young women make important decisions around their future career paths.

Industry has a massive role to play in articulating the opportunities that STEM-related skills and occupations can offer. Although these students will not be hitting the workforce for a number of years, it is vitally important to pique their interest in STEM at a young age.

Following the success of our pilot program, we hope to roll out *Resource Kids Connect* at a greater scale throughout coming months.

As Australia's national resources employer group, we are proud of our ongoing work in helping develop the skills needed for our industry's exciting future.

We look forward to engaging and working with many readers of *Minesite* throughout 2017, and continuing to support our sector's rapid evolution and the value we collectively deliver to Australian communities, economics and living standards.