On Country: Aboriginal Communities, Mining and Artificial Intelligence

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Key Terms

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Abstract

Autonomous vehicles have had a profound impact across the global mining sector, providing efficiency dividends and safety records that were once considered as one further failsafe against a downturn of the Australian economy. Fly-in-fly-out (FIFO) workers though have already witnessed a shift in their employment status as virtual reality, artificial intelligence and autonomous vehicles make capable sensing an environment and navigating with little or no human input. As radar, lidar, GPS, odometry and computer vision technologies meld with machinery, a very real threat is now facing Australian Aboriginal communities, that of cyborg CEO consortia from afar operating fleets of autonomous vehicles taking resources off country.

Fluoro Vests & Hard Hats

In 2007 I moved from Sydney to the country town of Orange in New South Wales, Australia which is home to a mixture of agriculture, mining, medical and manufacturing industries. The retail sector provides a glamorous family-friendly facade to a town that has faced (like many other Australian
rural communities) many booms and busts, none more so than that of the rags to riches stories the mining industry purports to catalyse.

I witnessed first hand locals welcoming Newcrest Mining [1] employees into their township wearing high vis. shirts and mud covered boots. Businesses hastily borrowed from banks beyond their means to outfit their establishments and force feed fly-in-fly-out workers fat on pay cheques. Rental prices rocketed as builders bustled to find enough bricks and mortar to meet demands for new housing.

A few short years later those same retail establishments learned of the threat to their income as the very same FIFO workers began losing shifts and contracts commensurately. Autonomous systems with names that resemble a science fiction film cast including the Sandvik Automine, Transmin Rocklogic, Controllogix PLC, CitectSCADA and Yokogawa Centum all began replacing the FIFO physical labour with omniscient sensor systems.

Fast forward to 2016 and according to Newcrest 100 workers positions are unable to be maintained, with no mention of the impact of automation or remote control technologies on these job losses.

“...The majority of the workforce at Ridgeway will be transferred to Cadia East, but the company said it could not find positions for 100 people. The company said while the figure was lower than first thought, it was a "sobering" time for many of the workers.” [2]

A newly minted report from the local Central Western Daily [3] revised that figure to an estimated 122 workers and a further 300 by the end of the year as Cadia East winds up, again with no mention as to the perceived or associated impact of automation technologies on the roles of workers in those locations.
Mining Automation

As we move to a mining sector where dump trucks, underground excavators, loaders and conveyor systems are transformed into partial or fully autonomous systems, there is little or no human required other than to maintain equipment or provide oversight by a range of distant surveillant technologies.

According to the International Mining Company publication many mining operators have been removed from the driver's-seat to the virtual cockpit:

“...AutoMine system is a highly innovative automation system where operators, who would normally drive a single heavy-duty machine underground, can now sit in the comfort and safety of an air-conditioned control room on surface, and simultaneously monitor the movements of a fleet of driverless loaders or trucks hundreds of metres below the surface. Sandvik loaders or trucks navigate their way between the load and discharge points under the control of a supervisory system which is managing the traffic and monitoring the machines. AutoMine is equipped with a number of intelligent functions for example, if one of the machines strikes a large rock in the roadway, the system would then place a restriction on the speed in that area to ensure that machines following behind either slow down or stop at the obstacle, thereby reducing potential damage to the equipment.” [4]

According to [5] the mining industry, despite recent advances in automation and the impact that has had on the immediate operator workforce, is in its infancy with automated systems stating:

“...Currently the industry is in the early days of this evolution, and working through the teething problems typically associated with any new technology. One stand out factor for automation is that it was pegged as being safer than many current techniques, as by removing the man from the operation you remove them from the risk.”
This begs the questions, that if the you remove the human (man or woman) from the operation then what employment role will that human now fulfill?

With only a handful of humans employed to run a fleet of vehicles from afar is the future of automation in the mining industry another notch in the magic milestone for a dawning Singularity? [6]

**Mining Virtualisation**

In 2012 a Western Australian based company published a press release [7] citing that their virtual meeting software could save valuable human resources, eliminating the need for workers to be on site rather operating from the comfort from an offsite location.
The very same company has recently touted that this virtualisation experience, control of equipment and communication with others is now transformed into real time from anywhere in the world via wearable technologies such as the Oculus Rift [9]:

"...They won't have to FIFO, they'll be able to take their work into better places and this is the technology that's going to be able to enable that," Mr Bester said.” [10]

In the very same article a Perth startup company with its eye on mining technique advancement, Minnovare, has been developing a device that helps better target drilling.

Romano Sala Tenna from Katana Asset Management states:

"We're seeing a company list every one to two days with a new technology project, so a resource-based shell that's given up the ghost on their project and looking at bringing new technology to market. They actually need technology just to survive because the next generation of ore bodies aren't going to be discovered with traditional technologies."

**Socio-Ethical Impact**

Mining has had an impact on many Aboriginal communities in Australia since the first occupation of white settlers, digging like wild rabbits and mad dogs seeking fame and fortune.

Irene Wilson, Committee Office, Department of the Senate April 1997 produced a large report titled ‘Impact of Uranium Mining on Aboriginal Communities in the Northern Territory’[11] which outlines the social impacts on communities, payment of royalty equivalent monies, Aboriginal control over, and pressure to consent to, mining; communication and consultation; and development of social impact statements for mining proposals.
A decade later according to Centre for Aboriginal Economic Policy Research (CAEPR) in 2006 in a report titled ‘Indigenous People and the Pilbara Mining Boom’:

“...The basic message conveyed is that little has been achieved over the past four decades in terms of enhancing Indigenous socioeconomic status in the Pilbara.” [12]

A few years later in the Journal of Energy & Natural Resources Law an article titled 'Indigenous Employment in the Australian Mining Industry' states in abstract that:

“...research data from two large mines with substantial indigenous workforces show that there is potential for positive outcomes to be delivered for indigenous people who do obtain work in the sector.” [13]

Almost 8 years have passed as we examine how one of many communities who once counted on the backbone of their workforce being locally employed or fly-in-fly-out operators spending money in their townships are coping. It brings into focus what wider impact this automation will have beyond the immediate economic or environmental concerns of citizens.

“The Mabo case, the Native Title Act and engagement with the mining industry have changed the assumptions of that (welfare dependent) paradigm and catapulted Aboriginal people engaged in the mining industry into the mainstream economy. I have worked at mine sites and witnessed this extraordinary change ... Mining offers many Indigenous populations a significant source of employment and contracting opportunities, as well as an alternative to the welfare transfers upon which many remote and regional Aboriginal communities depend.”

Professor Marcia Langton AM [14]
Contrary to Professor Marcia Langton’s assertion, it is not by choice that Aboriginal communities are dependent on government welfare handouts nor made dependent on the mining sector (that exploits the very country that Aboriginal communities are custodians for) rather, we have to question whether Aboriginal communities also have a choice in what automation, artificial intelligence and faceless international consortia will bring in the near future.

Also, in direct contrast to Professor Marcia Langton’s assertion that mining is a welfare alternative, Ghillar Michael Anderson, leader of the Euahlayi people and ambassador of the Aboriginal Tent Embassy in Canberra posits that the very act of closure for remote communities:

“...For the Western Australian Government to now dispossess and displace the Peoples of these homelands is designed to facilitate an expeditious expansion of mining interests and other developments.” [15]

As mining companies sublease [16] land back to the communities who have lived on that land for 40,000 years whilst elsewhere total virtual control of mining operations continue unabated from a capital city 1200 kilometres away [17] the trajectory for dystopic future scenarios are vivid.

Picture for a moment an international consortia led operation controlling a fleet of tens of thousands of vehicles autonomously mining the entire continent of Australia. If the trajectory of automated and associated wearable technology are to continue unabated, persuaded by the allure of wealth and fortunes that an insipid and vile mining royalty and its misguided cronies stockpile, then the scenario could well become a (virtual) reality, in turn having a marked effect on country, traditional owners and their communities.

On the flip side, artificial intelligence, robotics, wearable technologies and associated information systems may offer another ethical alternative to industries that at present simply exploit country.
“..The Virtual dreaming project is a complex game where the user, wearing a virtual reality headset, can engage with the traditional Aboriginal culture of the Darug people of New South Wales (NSW). The terrain over which people playing the game move, is Western Sydney University's Parramatta campus in NSW, as it was centuries ago. The aim of the project is to connect Aboriginal people to a virtual world that reflects their cultural heritage." [18]

As the case above extolls, by ethical design, perhaps those international consortia CEOs who are currently blind to the social impact of their enterprise will be required to attend cultural training via virtual connection prior to decision making and resource taking.

The virtual connection will reinforce the Law of Aboriginal communities, not just subject them to being subservient to government policy and pervasive lock-ins of a self serving mining entity. This all in turn may then thwart any evil orchestration by turncoats in far flung boardrooms wearing fake feathers and furs.

“...Ethics is a process of learning – not a process of obedience." [19]

The gun to the head metaphor could then dismissed as being an analogy from a bygone era, and now, in a positive ecologically sustainable manner Aboriginal communities can grow on country, not be fracked off it.
Bibliography


[8] K. Diss, Photo: Doug Bester says resource companies are now turning to his tech to save money now the boom is over. (ABC News: Kathryn Diss). Australian Broadcasting Corporation, 12 June, 2016.


