The Potential Impact Of Virtual Reality On The Mining Industry

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**Introduction**

Virtual reality or three-dimensional data imagining is transforming the mining industry and its processes. VR will profoundly enhance decision-making on-site through the data collected from it. Virtual reality in mining will offer an improved imprint of the setting that the miners work on as well as a profound understanding of the mining zone by revolving objects that could become hindrances when unnoticed. Unanticipated conditions are one of the significant problems in the mining industry that frequently leads to damage both on the environment and the miners. Familiarising virtual reality in mining will benefit miners in their planning and execution of their work. Expenditures can also be reduced if corporations incorporate virtual reality in the mining industry. Virtual reality and constructability will help in devising the best methodology for fitting the scenario and leaving no space for discrepancy and blunders. Many spatial softwares are being developed to mimic the mining sites such as, Oculus Rift, a VR headset that offers a feeling of immersion. Because of these progressions in digital technology concerning the mining industry, virtual reality in mining will trend globally and successfully.

**Discussion**

The hazards of [mining](https://portal.engineersaustralia.org.au/news/uwa%E2%80%99s-civil-and-mining-engineering-subjects-rank-world%E2%80%99s-top-50) operations are imminent, and training is the only method that tries to ensure workers health and safety measures. With VR technology these training can now be embedded into live projects which can be run off even on a laptop. In the mining industry, VR is said to be particularly valuable for distant or complicated settings. VR can be used for generic pieces of training, developing on-site training, and also for data layering environment. The simulated technology is providing exceptionally useful job drills for mine workers.With the developments in mining IT sector, companies have created various replicated training solutions for the mining industry and their workers. Such training applications or devices allow trainees to rehearse their skills before getting into the mine (Nagel, Granum & Musaeus, 2001). These virtual trainings are a very near to situations that miners have to deal with in real-time.

**Technology and Mine Operation**

Other than virtual and augmented reality, there are numerous other technologies that are facilitating the mining industry to build a relatively harmless work atmosphere for the mine workers. Some inventions that have already been executed in the mining sector embrace the use of self-directed drills, automobiles and drones. Drones can be specifically helpful in a variety of applications such as, assessing terrain, equipment examination, and filming explosions. Normally, a drone will arrange for safe and swift admission to diverse features of the mining process that are typically challenging to reach.

Self-directed automobiles and drills have significantly enhanced efficiency and on-site wellbeing. With the help of these equipment's a single worker can control several drills and trucks at a time (Tichon, Burgess, 2011). The most important and helpful element of these autonomous procedures and equipment's are that they take out the workers from the line of fire and reduces the risks and hazards of exposures to dangerous elements and types of equipment.

**Ground-breaking Education**

With around 86 universities presently using the virtual reality software, it is clear that VR technology has proven to be a considerable accomplishment The AVIE (Advanced Visualization and Interaction Environment) gives students the chance to experience 360-degree landscapes of the mines and to take on feasibility testing.

**Supporting Mental Health**

Innovations and developments in virtual reality know-how are not restricted to mine planning and industry decisions, and it can also be used to offer mental health support to mine workers. With the use of virtual reality, injured workers or those in need of assistance in remote locations can be offered help; nonetheless, further investigations need to be done to explore the practicality such assistance. It is also very likely that in future, such technology may allow the workers to relax or even use VR to engage with their families.

**Ensuring Safety**

Upcoming technologies in the mining industry are particularly focused on ensuring the safety of the miners and the environment as well. With the help of virtual reality, a cinema-like simulated reality with a 360-degree display can be formed to train workers and guide them to safety measures and much more. This can effectively prepare workers and rescue teams for real-time work conditions. The Australian mining industry has progressively accomplished extraordinary performance and workers welfare results through nonstop enhancement of the preparation criteria (Pedram, Perez & Dowsett.2013)

**Addressing Environmental and Social Issues of Mining**

Furthermore, in addressing the protection and efficiency in the mining sector, new technologies are also proposing a way to address a few of the ecological and communal problems that the mining sector encounters. For example, more than 50 per cent of the world's cobalt metal comes from the Dominican Republic, and most of the workers who are working in these cobalt mines are youngsters or teenagers, according to estimation the number of children is around 40000 (Thorsen, 2012). With the help of this new technological revolution taking place in the mining industry, such as autonomous trucks and drills, will help significantly in taking these teenagers out of this unforgiving industry.

**Creating an Intelligent Mine: Mine Design & Planning**

In the near future, companies are looking forward to creating an intelligent mine; this goal can be realised very soon and with few changes only in the current technology in place by merely implementing small changes or adding few more features to the technology.

With the optimisation of mines and constructing of designs, allows investors or stakeholders to get a chance to observe the mine virtually in real time 3D (Nagel, Granum & Musaeus, 2001).

**Data limitations**

Usually, the data related to mining operations and planning is looked at in segregation. Mining schemes contain a variety of data namely, mine planning, geological and gas managing and how the equipment works. All of this material can be covered in one single graphics situation. This will also allow the information to be understood and scrutinised in a way that organisations usually haven't done previously. With the help of virtual surroundings, a variety of circumstances can be made to gather data about the prospective situation and look for solutions just in case.

**Conclusions**

Since the beginning, working in the mines has always been a hazardous job. With the constant risk of cave-ins, on-site explosions etc. mining is considered one of the most extreme jobs in the world and hundreds of people lose their lives or health in the process. Moreover, children are being used to do perform such hazardous jobs violating international human rights law and ethics of the business. Around the world families of miners are in constant fear for the lives of their loved ones. Not only this, the industry has to face numerous issues in planning and devising strategies for their workers and to provide safe facilities. For the above reasons, the emerging technologies such as Virtual reality can help substantially in generating a safer atmosphere for the workers of the mining industry. With the help of these simulated technologies, a much helpful, more reliable and cost-effective work environment can be shaped. Virtual reality in the mining industry is just the beginning of a revolution in this sector and new features are continually being added to it.

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