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Riding The Industry 4.0 Wave

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The First Industrial revolution happened in 1760 when mechanization happened through water and steam power. Since then, it has improved through mass production and assembly lines using electricity in the second, computerization in the third revolution.

The Fourth Industrial Revolution is the trend towards automation and data exchange in manufacturing technologies and processes which include cyber-physical systems (CPS), **IoT**, **industrial internet of things**, cloud computing, cognitive computing, and **artificial intelligence**.



When computers were introduced in Industry 3.0, it was disruptive as it was the addition of entirely new technology. Now a combination of cyber-physical systems, the **Internet of Things** and the Internet of Systems make Industry 4.0 possible and the smart factory a reality. As a result of the support of smart machines that keep getting smarter as they get access to more data, factories are going to be more efficient and productive and less wasteful. Ultimately, it's the network of these machines that are digitally connected & create and share information that results in the true power of **Industry 4.0**.

Even though some dismiss Industry 4.0 as merely a marketing buzzword, we can't close our eyes from the reality of what the smart industries can do. Industry 4.0 offers the opportunity for manufacturers to optimize their operations by knowing what needs their attention providing better analysis & insightful maintenance within a reasonable timeframe. And in some cases, autocorrect them. A gold mine in Africa could identify the root cause with oxygen level during leaching by analyzing the data from sensors and were able to increase their yield by 3.7% which saved 20 million dollars annually.

A connected manufacturing system can adjust to reality such as weather delay in shipment, and modify manufacturing priorities. Robots move goods around Amazon warehouses and also reduce costs and allow better use of floor space for the online retailer.

There are shipping yards that are leveraging autonomous cranes and trucks to streamline operations as they accept shipping containers from the ships. Advances in the use of metal

additive manufacturing (3D printing) have opened up a lot of possibilities for production. In the Mining sector, a whole lot of activities happens where Man-Machine combination is quite high.

From a survey, excavation, production, transportation to compliance according to the statutory laws of the land, a lot of manual efforts put in. However, there has been a lot of areas where the automation has taken place such as IOT based climate data collection, Dronebased survey, **Automated Weigh Bridge**, SCADA based transportation, contactless permit/pass generation etc.

However, these machines work in silos, once connected, the entire process can be transformed from Automated to Smart. Also, compliances to government regulations would be seamless. While Industry 4.0 is still evolving and we might not have the complete picture until we look back 30 years from now, companies who are adopting the technologies realize Industry 4.0's potential. In the mining sector, as in most other industries, the future of work is expected to look very different than it does today. Automation, analytics, and **artificial intelligence (AI)** are not only reallocating work between humans and machines but also generating greater insights into employee productivity and efficiency. However, the companies need to put the effort into upskilling their current workforce to take on new work responsibilities made possible by Internet 4.0.



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