

Circular Offers Transparency for Mineral Sourcing with Oracle Blockchain Platform

“We bring transparency to the supply chain for consumer electronics and electric vehicles manufacturers. Oracle Blockchain Platform enables us to transparently record and share the source of all raw materials using distributed ledger, which prevents unethically sourced minerals from passing through the supply chain. This will also cut costs for miners who currently shoulder this compliance cost in our industry.”

— Douglas Johnson-Poensgen, CEO, Circular

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Summary

Circular enables tracking of raw materials across the consumer electronics and electric vehicle batteries supply chain on Oracle Blockchain Platform.

The global markets for consumer electronics and electric vehicles are growing rapidly and so is the demand for raw minerals they greatly depend on. More than 30% of the world's population owns a smartphone, while electric vehicles are expected to have 50% market share in Europe and North America by the year 2025.

Demand for raw materials such as cobalt, tantalum, and tungsten, which are critical to electronics and electric vehicle battery manufacturing, grows exponentially. Large quantities of these minerals come from Central Africa, where human rights organizations report extremely bad working conditions and cases of child labor. In 2014, UNICEF reported that there were as many as 40,000 child miners in the Democratic Republic of Congo alone. Amnesty International, meanwhile, reports that the cobalt industry is rampant with illegal and unethical practices. This results in increased pressure on manufacturers to ensure the ethical sourcing of their raw materials and full visibility into their supply chains.

Leveraging artificial intelligence (AI) and blockchain, Circular builds solutions to track provenance and improve efficiency in complex global supply chains. The company provides vital information about the authenticity and sourcing of raw materials used in manufacturing and recycling.



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Business Challenges

- Enable manufacturers of consumer electronics and electric vehicle batteries to effectively track the source of specialty raw materials along their supply chain—from mining to smelting, components manufacturing, final assembly, and all the way to recycling
- Enable manufacturers to effectively demonstrate compliance and ethical practices to their customers, shareholders, and regulators without relying on collection and authentication of stacks of paper attestations produced along the supply chain and lower their regulatory compliance costs
- Empower Central African countries to fight unethical working conditions, develop local economies, and eliminate causes for conflict with neighboring countries—while preventing their populations from being exploited due to a lack of transparency and oversight
- Help miners demonstrate ethical business practices in mining and delivery of conflict minerals to address buyer concerns, gain access to markets, attract investors, and substantially reduce compliance costs

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Results

- Developed a platform—powered by Oracle Blockchain Platform—to track raw materials in the electronics and electric vehicle supply chain from the mine to the finished product and then to recycling, enabling manufacturers to prove that they source raw materials ethically and sustainably
- Created a distributed permissioned ledger based on Linux Foundation’s Hyperledger Fabric architecture where smart contracts verify the chain of custody, chain of ownership, and chain of provenance of minerals before these records are committed to the ledger—while participants have transparent access to all the shared data they are authorized to see via effective access controls in the permissioned Oracle Blockchain Platform
- Provided all permissioned parties with end-to-end transparency on Oracle Blockchain Platform, ensuring that all transactions pass a series of proofs to record provenance for a batch of minerals that is being tracked along the supply chain, as raw materials and manufactured components move between companies
- Implemented the Circular Protocol to prevent data corruption using strict rules for adding data to the blockchain, verifications that the process took place at an accredited facility, at the expected time, for the expected duration, and in a way that matches the site’s declared operating capacity, Global Positioning System (GPS) tracking, and facial recognition of authorized personnel
- Digitized raw materials and finished goods reliably and created immutable records of location, composition, identity, and chain of custody in the supply chain—subsequently analyzing the data with artificial intelligence to identify anomalies, validate compliance, and engage in investigative action if needed
- Reduced the cost of compliance and due diligence processes to a fraction of those required by other technologies, while using Oracle Blockchain Platform to deliver tamper-proof traceability of raw materials and finished goods that other technologies cannot provide
- Helped miners and manufacturers to more easily comply with international legislation relating to raw material sourcing and sustainable supply chains, while meeting consumer expectations that products are sourced and manufactured using ethical business practices



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“The Circular platform built on Oracle Blockchain Platform is used to tag, track and trace conflict minerals from the local mine to the manufacturers. Oracle’s pre-assembled blockchain enabled Circular to focus on our specialty—minerals tracking—without spending time and effort on building hardened blockchain infrastructure, and it substantially sped up our time to market, while providing confidence to our end users. Even intermediate products mixed with other raw materials will be tracked on the platform. Its extensive REST APIs and integration adapters also enable manufacturers to easily integrate with other supply chain applications they use in their organizations.”

— Douglas Johnson-Poensgen, CEO, Circular