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From Manual to Automated: The rapid transformation of India's Cement Industry

The Indian cement industry is crucial for the country's economic growth. This article gives a crisp brief on how cement companies are able to improve their product quality, ensure timely maintenance, improve logistics, reduce their carbon footprint, and become more sustainable in the long term by automating processes and leveraging data.



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India is already the second largest cement producer globally, and considering the rising demand and consumption, it becomes imperative for cement companies to leverage technology and achieve higher operational efficiency in product manufacturing, make processes sustainable, enhance safety, and make the entire ecosystem more profitable.

Digitalisation and automation are rapidly transforming

industries. They have made it possible to overhaul conventional manufacturing processes, bring uniformity to fragmented systems in cement plants, and support them so they can thrive. With the integration of automation systems in cement plants, it becomes easier to help manufacturers become more efficient, get higher levels of control and monitoring, achieve better quality, and have



more flexibility to withstand disruptions and stay ahead of the curve.

Digitalisation and Automation

Today, automation is playing a very crucial role in the cement industry. By automating processes and leveraging data, cement companies are able to improve their product quality, reduce energy consumption, ensure timely maintenance, improve logistics, reduce their carbon footprint, and become more sustainable in the long term. The availability of automation systems is supporting them in overseeing and managing different stages of cement manufacturing, such as monitoring and controlling raw material feed, blending, grinding, kiln operations, and clinker production, among others. Notably, the cement makers are not behind in integrating the latest technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Machine Learning (ML) and are benefiting from them to get a competitive advantage.

For example, the integration of IoT is making key operations hassle-free, such as fleet management, supply chain management, energy and resource utilisation, and others. Nowadays, AI engines and ML based platforms are making it easier to optimise manufacturing processes and automate logistics operations for quick turnarounds. Also, with automation, identification and volumetric analysis of materials and stockpiles have become more seamless.

The cement plants are further optimising their logistics processes with automation systems. This includes transportation, storage, and distribution that enable them to reduce transportation costs, manage inventories, and achieve efficient delivery. With data analytics, it becomes possible for cement companies to find the root cause of quality-related problems and optimise their production parameters for ensuring high product quality. For companies operating in multiple geographies, digitalisation is helping them encompass their plants and physical assets in various locations for better management and control, resulting in business success. Additionally, it keeps them a step ahead by supporting them in utilising technology to identify and implement the best methods and practises across their company to deliver more value to consumers.

Automation in cement manufacturing is also leading to higher levels of productivity and worker safety. For instance, real-time monitoring of equipment conditions is helping with predictive maintenance, reducing downtime, and ensuring timely problem-solving, thus reducing the risks or chances of breakdowns or potential hazards. Also, these high-end systems are capable of performing tasks with more precision, speed, and consistency. Thus, they completely eliminate the need for manual intervention in handling tasks that can be challenging, difficult, or even impossible for humans to achieve. This decreases the chances of accidents and ensures the overall well-being of workers. For example, digital tools are capable of



The demand for cement in India is on the rise

monitoring the emission of harmful gases and pollutants and improving emergency response to make the entire ecosystem safer and healthier for workers.

Technology makes cement manufacturing more sustainable

The cement industry is responsible for around 8 percent of carbon dioxide emissions globally. Considering the criticality of addressing climate change while ensuring the demands are met efficiently, it becomes important to find the right balance between cement manufacturing processes and sustainability to lower the impact on the environment, and technology is definitely the biggest enabler to achieve it.

Here, leveraging digitalisation and data analysis can play a crucial role in promoting sustainable cement manufacturing practises. They can enhance energy efficiency, lower carbon emissions, reduce waste, and improve overall production processes. Digital solutions can improve the energy efficiency of cement production equipment such as kilns and mills, and advanced process control systems can optimise temperature and pressure to reduce energy consumption.

Sustainable steps ensure the process

To combat climate change, the Indian government has set a target of achieving a majority of its energy requirements from renewable sources by the end of this decade and becoming a net-zero economy by 2070. The cement industry, with the help of technology, can definitely become a major contributor to

making sure the goals are met quickly. Technology can support systems in becoming capable of running on renewable power sources, monitoring and tracking of fuel consumption, wise allocation and utilisation of resources, and most importantly, achieving an end-product that not only meets the needs and serves the purpose but is also eco-friendly.

Thus, in addition to increasing productivity, the implementation of automation can also propel the entire industry towards becoming more environmental friendly and sustainable.

The demand for cement in India is on the rise. The housing sector, which accounts for 60%–65% of cement consumption, is witnessing a surge in demand. In addition, infrastructure development is gaining pace across the country, and continued investments in building road networks and high-value infrastructure projects to spur economic growth will catapult cement demand to new heights, propelling cement makers to ramp up their production. According to an industry report, India's cement production will climb by around 6–8% over the fiscal years 2023 and 2024, following a 21% jump for the fiscal year ending March 2022.

Automation is revolutionising the way cement plants operate by reducing costs, increasing efficiency, and improving safety. It is also ensuring that the processes are carried out accurately, consistently, and sustainably with minimal human intervention. With growing demand, consumption, and economic importance, it is crucial in cement manufacturing to leverage technology to meet the rising demand and expectations in a more cost-effective, energy-efficient, and sustainable way to deliver better value in the long term. □