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Ramco's Green Digital Canvas

Ramco Systems Limited, UAE

Cement production, a vital industry powering global infrastructure, has long been under scrutiny for its significant environmental footprint. The emission of greenhouse gases, particularly CO_2, during cement manufacturing poses a substantial threat to the environment. However, the industry is at an inflection point, with major players spearheading efforts to minimize emissions and embrace sustainable practices.

In response to the pressing need for emission reduction, cement manufacturers are implementing a range of strategies aimed at mitigating their environmental impact. One such approach involves increasing the usage of blended cement, a mixture that incorporates supplementary cementitious materials, thus reducing the reliance on traditional Portland cement and cutting down CO_2 emissions. Additionally, a shift towards adopting renewable energy sources, such as solar and wind power, is underway to power cement plants, further reducing carbon emissions. Moreover, exploring alternative fuels like biomass and waste-derived fuels offers a promising avenue to decrease greenhouse gas emissions in the cement production process.

The integration of Environmental, Social, and Governance (ESG) considerations has become imperative in guiding sustainability practices within the cement industry. Companies are recognizing the importance of making decisions that not only minimize environmental impact but also uphold social responsibility and ensure robust corporate governance. This holistic approach to sustainability is shaping the industry's trajectory, influencing decisions across all levels of operation.

In the quest for sustainability, digitalization emerges as a powerful tool for cement manufacturers to future-proof their operations and meet evolving business demands. Aligned with the principles of Industry 4.0, companies like Ramco are pioneering digital solutions tailored to address the unique challenges faced by the cement industry.

In order to have complete control over cement business, the top decision-makers need to have solutions and tools deployed from shop floor to board room impacting plant, people and processes. These tools enable green cement production quarry to dispatch. At the plant level, AI-driven advanced expert systems co-exist with the DCS and Scada Systems and ensure that parameters such as productivity, efficiency, clinker factor, Thermal Substitutions Rate (TSR) and CO_2 emissions are optimized. At operational level, MES systems with predictive and prescriptive capabilities ensure streamlined production planning, execution, asset performance, control on OPEX, and compliances on HSE. At an enterprise level, the Business Intelligence (BI) applications ensure that there is a unified data backbone that helps build and populate the right metrics for effective decision at levels of the organization.

Ramco's comprehensive digital ecosystem encompasses a range of tools and solutions designed to tackle challenges across various layers of cement manufacturing. From Plant Performance Management (PPM) systems optimizing operational efficiency to Plant Operations Management (POM) systems ensuring seamless integration between business management and plant performance, Ramco's digital canvas offers a holistic approach to sustainability.

The below illustration captures four categories of interventions at various levels:
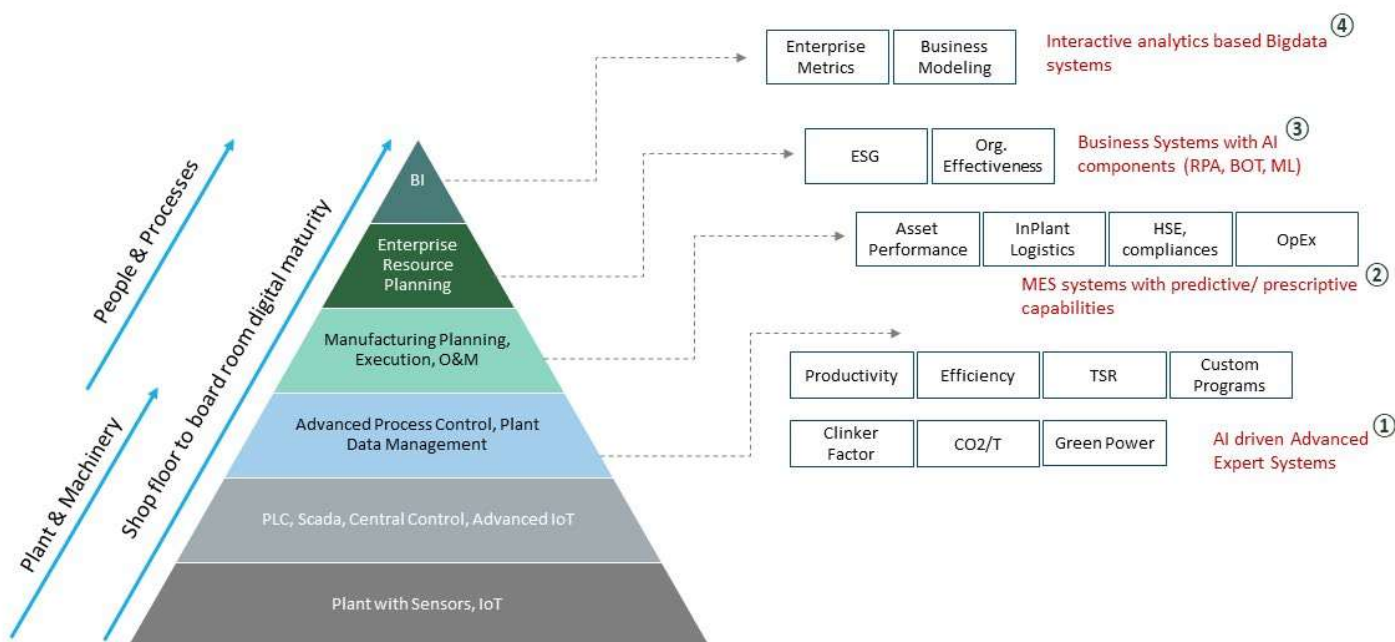
Category 1:

In this category, challenges are very dynamic in nature. It is about realising your business objectives of TSR, Clinker Factor, SPC, SFC, etc. and thereby demonstrating your commitment towards making cement greener. You need advanced and AI driven optimizers to handle process control and plant operation (e.g influence of alternate fuel) to ensure plant is operated at its optimum level all the time while meeting your business objectives.

One notable solution offered by Ramco is ProcessSuite, the world's most advanced expert optimizer combining Model Predictive Control (MPC) and Machine Learning (ML) based Real-Time Optimization (RTO). ProcessSuite optimizes milling, grinding, and pyro operations, effortlessly handling complexities introduced by alternative fuels while ensuring the plant operates at optimum levels.

Another innovative offering from Ramco is BlendX, a blending optimizer based on MPC technology, aligning with business objectives such as additives economics and cement quality. These solutions have been successfully implemented worldwide, demonstrating their efficacy in driving sustainable cement production.

Unlocking the value of data generated by cement plant assets is crucial in optimizing operations and driving sustainability. Ramco's Plant Data Management (PDM) unifies data from disparate systems, creating a digital backbone for real-time visualization and historical analysis of plant operating data. Additionally, Ramco's Conveyor Vision innovation utilizes AI technologies to enhance loading and dispatch efficiencies, eliminating the need for conventional sensors while accurately counting and reconciling bags loaded.

Category 2:

In this category, the priorities of plant managers are around production planning, scheduling, execution, tracking. The key KPIs are containing OPEX and improving OEEE. Ramco offers a purpose-built Manufacturing Execution System (MES) for the cement industry. It helps in precise planning and execution - both short and long-term. Cement business is capital intensive. Ramco has an integrated asset management solution to track and optimize the performance of plant machinery and equipment to maximize return on assets. Transportation and Storage of cement requires utmost care, as the risk of spoiling and wastage is always looms. Ramco's in-plant and external logistics solution addresses this aspect through tracking and tracing at all stages while cement is in transit.

Category 4:

This category deals primarily with visualizing the right stories from the operational and business data. It entails building a reliable data backbone and business data model. Once it is established, the decision-makers can create the right metrics and track them for effective decision-making across all levels of the organization. A CEO can visualize the performance of each of his plants on a real-time basis sitting in the headquarters. The information is presented in such a manner that they can take efficient decision just by using the platform.

Category 3:

It is imperative to integrate operational information with corporate functions such as Finance, Planning, Procurement, Sales and Human Resources. Ramco's ERP acts a comprehensive platform that ties together these functions with operational and plant level activities. It is sprinkled with elements of Robotic Process Automation (RPA), Machine Learning and Bots to enhance productivity and user-experience.

In conclusion, Ramco's green digital canvas offers a comprehensive suite of solutions to accelerate the transition towards sustainable cement production. With modular offerings and a roadmap-driven approach, Ramco empowers cement manufacturers to navigate the complexities of sustainability and drive towards a greener future. By embracing digital transformation, the cement industry can not only reduce its environmental footprint but also thrive in an ever-changing business landscape, ensuring a sustainable future for generations to come.