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Arvind K Garg,
Advisor to the Chairman & Managing Director, Larsen & Toubro

How do you view the evolution of technology in the construction and mining equipment industry over the last decade?

Over the last decade, Construction and Mining equipment, including both the Komatsu range of Equipment and L&T's road machinery, has evolved from predominantly mechanical, stand-alone machinery into intelligent, electronically controlled and connected systems. Advances in hydraulics, engine management, sensors and digital controls have improved productivity, fuel efficiency, reliability, safety and ease of operation. The larger transformation, however, is at the jobsite level, where machines, operators and project teams are increasingly connected through real-time data.

Komatsu's Smart Construction ecosystem reflects this shift by integrating equipment with 3D terrain models, drone surveys and digital site information. At EXCON 2025, L&T and Komatsu demonstrated the next step in this evolution by remotely operating a Komatsu excavator in Japan from Bengaluru.

Such technologies can enhance safety, extend specialised operating capability to remote locations and improve continuity in difficult working environments.



How are customer expectations driving technological advancements in construction and mining equipment?

Customers now assess equipment not merely on its acquisition cost, but on the value it delivers throughout its operating life. Higher

productivity, lower fuel consumption, dependable uptime, enhanced safety, operator comfort, ease of maintenance and proactive, technology-enabled product support have therefore become central to equipment development.

Komatsu is optimising hydraulic and engine performance, introducing intelligent operating modes, simplifying machine controls and improving onboard diagnostics to meet evolving customer expectations. These technologies also help reduce dependence on individual operator skill and deliver more consistent results across applications and shifts.

This is moving the industry from a product-centric model towards a solution-oriented approach. For Komatsu and L&T, the objective is not simply to supply a machine, but to help customers achieve higher output, safer operations, better availability, higher productivity and a lower total cost of ownership.

What are the latest technological advancements incorporated into your equipment portfolio?

The Komatsu portfolio brings together advanced powertrains, optimised hydraulics, electronic controls and application-specific machine-management systems. In hydraulic excavators, selectable working modes, one-touch power enhancement, ECO guidance and real-time fuel information help operators balance output and efficiency. The PC210-10M0, for example, combines strong digging performance with an advanced management system designed to lower fuel consumption.

Recent additions also illustrate how technology is being tailored to different applications: the PC225 for enhanced stability and lifting performance, the PC500 for the mid-mining segment, compact excavators for confined urban work, and the HB365 Hybrid Excavator for improved energy efficiency.

In the mining range, electronically controlled transmissions, automatic retard speed control, advanced braking and vehicle-health monitoring improve control, safety and consistency under demanding operating conditions.

How are GPS, machine guidance, grade control and precision-control technologies improving operational accuracy and productivity?

Komatsu's Smart Construction and intelligent Machine Control technologies allow machines to work directly with GPS or GNSS positioning, 3D



design models and terrain data. Through an in-cab display, the operator can see the machine's position, bucket or blade movement and the required design surface.

Depending on the machine and configuration, semi-automatic controls can assist in maintaining the required depth, slope or grade. This reduces reliance on physical survey markers, repeated measurements and manual checking. It also helps minimise over-excavation, unnecessary material movement and rework.

Projects can therefore be completed closer to specification in the first attempt, saving time, fuel, labour and material. These systems also help less-experienced operators perform complex grading tasks more consistently while enabling skilled operators to achieve higher productivity.

How are telematics, remote monitoring and fleet management solutions helping customers improve equipment utilisation and operational efficiency?

Komatsu's KOMTRAX telematics system gives customers remote visibility into machine location, operating hours, utilisation, idle time, fuel consumption and operating cautions. Fleet managers can use this information to identify underutilised machines, excessive idling, irregular operating patterns or deployment imbalances across sites.

Geo-fencing can strengthen asset control, while comparisons across machines and applications can reveal opportunities to improve operating practices. For large mining equipment, KOMTRAX Plus provides deeper insight into payload, equipment health and critical operating parameters. L&T's DiGi Eye similarly extends connected visibility to L&T equipment.

The value lies not merely in collecting data, but in converting it into action—improving deployment, reducing idle time, controlling fuel use and supporting more informed fleet decisions.

How are technology-enabled maintenance solutions helping customers reduce downtime and operating costs?

Komatsu and L&T are leveraging cutting-edge technology to move product support from reactive repairs towards preventive and condition-based maintenance, helping minimise failures and improve reliability, uptime and productivity. Machine alerts, operating trends and diagnostic information enable L&T's product-support teams to identify developing issues and plan timely interventions and maintenance before they lead to major loss of productivity.

Komatsu Oil and Wear Analysis, or KOWA, adds another layer of insight by analysing lubricants and fluids for wear particles, contamination and abnormal trends. This supports maintenance decisions based on the actual condition of components rather than relying solely on component age or physical inspection.

Digital information also enables service teams to arrange the required manpower, Genuine Komatsu Parts, lubricants and tools before reaching the site, thereby reducing diagnosis and repair time. By combining connected diagnostics, fluid analysis and skilled field support, Komatsu and L&T help customers improve machine availability, extend component life and control lifecycle costs.

How is technology strengthening after-sales support and customer service across the equipment lifecycle?

Technology is enabling L&T to make after-sales support faster, more proactive and better coordinated. Machine information from Komatsu's KOMTRAX and other digital platforms helps our product-support teams understand operating conditions, identify service requirements and prepare for interventions before reaching the customer's site.

Digital service processes also improve coordination among customers, L&T service teams, dealerships, workshops and parts centres. Service history, machine alerts and maintenance records help technicians diagnose issues more accurately, while better planning ensures that the required manpower, tools and Genuine Komatsu Parts are arranged in advance.

L&T's Central Warehouse at Nagpur, supported by SAP-EWM and SAP-IBP, strengthens parts availability and distribution across the country. This digital supply-chain backbone helps improve inventory planning, order processing and movement of parts to regional stocking points and customer locations.

Technology also supports operator and maintenance training through machine data, energy-saving reports and application-specific guidance. By combining digital systems with L&T's field-service network and domain expertise, we are able to deliver quicker response, better parts support and more consistent customer service throughout the equipment lifecycle.

What emerging technologies are likely to have the greatest impact on the industry over the next five years?

The next five years will be shaped by the convergence of automation, artificial intelligence, advanced analytics, digital twins and alternative power systems. Autonomous and remotely operated equipment will expand in mines, quarries and hazardous locations, improving safety while helping address skilled-operator shortages. Komatsu's FrontRunner Autonomous Haulage System already demonstrates the potential of integrated autonomous fleets.

Artificial intelligence will increasingly interpret machine and site data, identify abnormal patterns, forecast component condition and recommend operational actions. Digital twins will provide live virtual representations of job sites, helping teams compare planned and actual progress and optimise

the movement of materials and equipment.

Electrification, hybrid systems, trolley assist, power-agnostic haul trucks and hydrogen fuel cells will also advance, with the most suitable solution determined by machine class, duty cycle and site infrastructure.

The future is exciting because these technologies will not operate in isolation. Their true impact will come from connected machines, intelligent jobsites and integrated support systems working together to deliver safer operations, higher productivity, lower emissions and greater lifecycle value. For customers, this will mean not only smarter equipment, but a more predictable, efficient and sustainable way of working.