Tooling management: Gaining competitive edge with automation

In their drive to stay competitive, manufacturers looking for cost and productivity advantage take to automating tooling management.

MAT Khan

Manufacturers continuously look to improve efficiency, reduce costs and increase productivity to stay competitive but often lose edge due to downtime on account of unplanned tool changeovers or inept inventory management of tools

Automating tooling management helps them plan, acquire, utilise and optimise all types of tools and equipment used in manufacturing process; including helping them in tool management with systematic organisation, tracking and control of individual tools, drills and inserts.

"Automated tooling management systems (ATMS) offer a wide range of benefits both in the tool-room and on the shop-floor. Manufacturers can leverage these systems, for cost reduction, and improvements in productivity and efficiency," says Hemant B. Bhattbhatt, Managing Partner & CEO, Hmsa Consultancy.

In the competitive world of manufacturing where cost reduction and productivity enhancement is very critical, it is only natural for automating tooling management to gain traction in a vibrant manufacturing sector.

"Automating tooling management is pivotal in today's fast-paced production landscape," says Amit Raina, Country Manager, Dormer Pramet India; a leading supplier of metal cutting tools and related services.

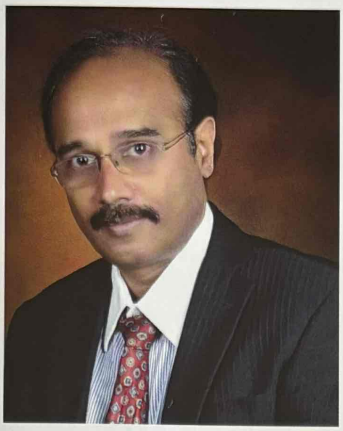
"The initial cost of adopting automated tooling management systems could be a challenge, particularly for the MSMEs."
Prabhakar J, Director Operations, 3D Concept Analysis & Development India Pvt Ltd (3D CAD)

Industry recast

"Antiquated documentation methodologies in tool-room, potential errors in loading tools on the machines, miss-coded tools, and potential errors in tool transport contribute to significant losses in productivity, down-time, tool damage and waste in machining operations," says Bhattbhatt reviewing tooling management the old way and giving a context to the changes taking place.

Precision inventory control with real time inventory tracking, optimisation of tool usage by monitoring of tool usage and wear, minimising downtime by predicting tool wear and scheduling of replacements, mapping usage patterns with data analysis and the prospect of integrating automated tooling with other manufacturing and business systems are some of the industry-shaping benefits of automated tooling that Bhattbhatt highlights.

No doubt, automated tooling management is bringing a paradigm shift in the manufacturing



▲ **Prabhakar J**, Director Operations, 3D Concept Analysis & Development India Pvt Ltd (3D CAD)

▲ **Amit Raina**, Country Manager, Dormer Pramet India.

▲ **Hemant B. Bhattbhatt,** Managing Partner & CEO, Hmsa Consultancy.

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ways in the country.

"The industry is witnessing a transformative shift towards productivity and data-driven decision-making as technologies reshape manufacturing processes," says Raina. He elaborates in some detail the benefits of automated tooling.

Reducing manual handling, automating tooling management streamlines processes and minimises downtime associated with tool changeovers giving increased throughput in production. As automated systems precisely measure tool wear and predict tool life, tool usage gets optimised ensuring consistent and accurate machining which in turn reduces scrap rates and reworks lowering overall production costs, apprises Raina.

By tracking tool usage patterns, automation predicts future requirements and prevents excess inventory or stock-outs ensuring optimised working capital. Besides, proper calibration and timely replacement of tools minimises variability in machining processes and thereby enhances the overall product quality.

Moreover, monitoring of tool conditions in real time enables auto generation of alerts for tool replacements before any failures occur, preventing unexpected downtime and maximising equipment utilisation.

Automation also reduces the labour cost incurred on manual tool management tasks and manual machining in hazardous environments

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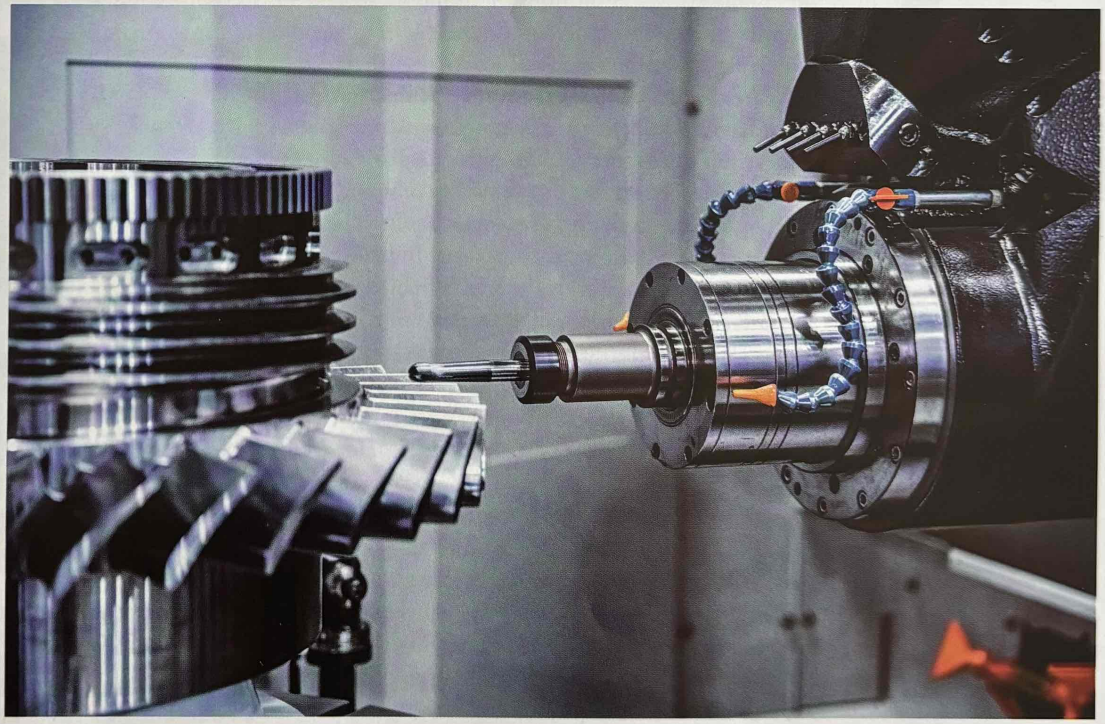
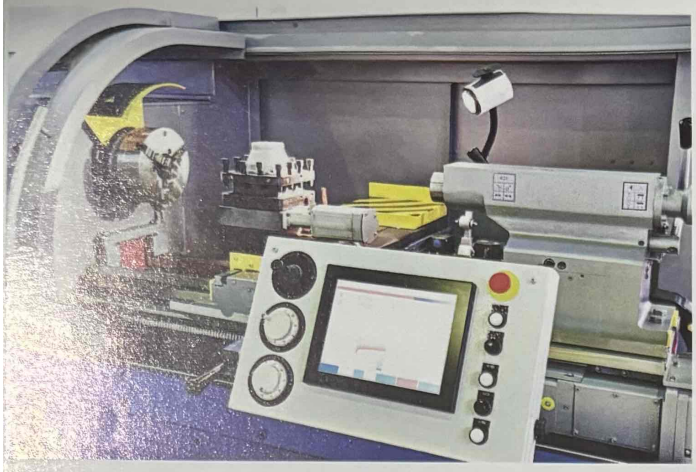


▲ **Automating cutting tools** can help improve tool stability, standardize cutting performance and extend tool life



▲ **Machine tool suppliers** are advancing their offerings to include automation, better controls and machine monitoring

▲ **D Shanmugasundaram,** Managing Director of S&T Group and Vice President of TAGMA

▲ **Prashant Sardeshmukh**, Managing Director, MMC Hardmetal Pvt Ltd.

while enhancing workplace safety.

Armed with extensive data on tool performance, usage history and machining parameters, manufacturers can identify trends, optimise machine processes and take informed decisions to ensure enhanced operational efficiency and product quality.

With these compelling arguments, Raina establishes the benefits of automating tooling management and how it is fundamentally changing the manufacturing landscape.

Integrating systems

Adoption of automation for tooling management is likely to see growth in a variety of components, drives and software solutions that support automation, connectivity and tooling management.

"The latest technological advancements in automated tool management systems involve a spectrum of solutions ranging from software based systems to vending systems, and chip or RFID-based tools offering real-time and precise measurement of tool wear," acquaints Raina.

"Seamless integration is the key. Modern automated systems not only integrate with SAP or other ERP systems but also can connect with tool pre-setting CAD CAM and MES. This integration is facilitated through advanced software interfaces, ensuring a cohesive flow of data across systems," Raina elaborates.

The use of RFID (Radio Frequency Identification), IoT sensors, cloud based platforms, Artificial Intelligence and smart phones are some of the technological advancements in the automated tooling management systems.

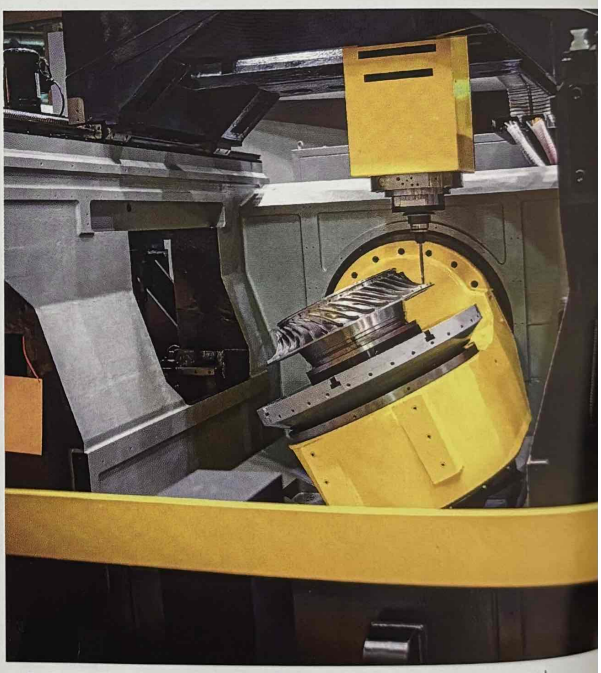
RFID enables tracking of tools and monitoring of usage while sensors embedded in tools collect data on tool performance and conditions for usage optimisation. Cloud based platforms accord remote access to tooling data which makes it possible for a senior management to monitor and manage from distant locations. Artificial Intelligence helps in data analytics for maintenance scheduling by identifying patterns. Mobile applications enhance convenience and accessibility.

> "Tool room sector is growing phenomenally in India. Big things are happening."
> D Shanmugasundaram, Managing Director of S&T Group and Vice President of TAGMA

Strategising collaboration

For all its advantages, adoption of automation in tooling management is challenging. "All the typical challenges an organization faces in introducing any automation are also antecedent to adopting ATMS," Bhattbhatt alerts.

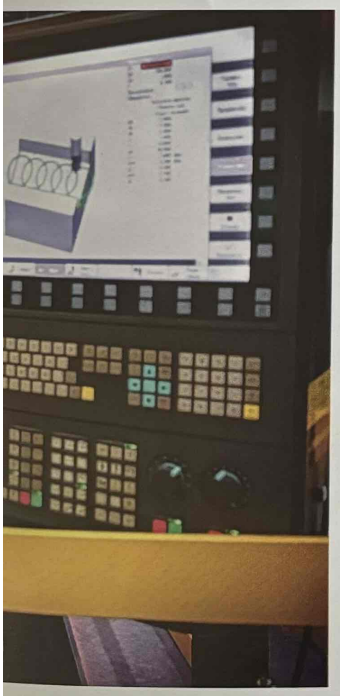
Prabhakar J, Director Operations, 3D Concept Analysis & Development India Pvt Ltd (3D CAD); a company among the leaders in advance



▲ **Automation is** a clear trend towards saving resources and sustainable manufacturing.

▲ **Adopting robotic automation** in the cutting tool industry has proven to be a catalyst for increased productivity and efficiency.

"With the 'Aatma Nirbhar Bharat,' and the 'Make in India' campaign, the die and mould industry is growing rapidly in India. We all are going to benefit,"
Prashant Sardeshmukh, Managing Director, MMC Hardmetal Pvt Ltd.



manufacturing solution avowedly with vast experience in resolving tooling and automation requirements delves into the challenges.

"The initial cost could be a challenge, particularly for the MSME sectors," he says. "Integrating new systems with existing processes, machineries and databases can be complex. Also, there could be a natural resistance to change in adopting new technologies; sometimes due to the insecurity of the working personnel in the shop floor," he adds.

To overcome these challenges, management should evaluate the financial benefits and educate the working team about the benefits of adopting the new technology. These benefits could be such as ease of work with organised availability of tools, standardisation of tools, reduction of inventory costs, and avoidance of machine stoppage due to stock outs of tools, prescribes Prabhakar. Insecurity issue also needs to be addressed, he adds.

"Implementing automated tooling management systems present various challenges for manufacturers requiring careful consideration, collaborative and strategic approach to overcome them," Raina puts concisely.

Outlook

The outlook for manufacturing in India is that of stable growth. As manufacturing grows, the demand for productivity enhancing and price reducing automated tooling management will also grow. More so, as it enables industry 4.0 initiatives which are being increasingly adopted by Indian manufacturers.

"Tool room sector is growing phenomenally in India. Big things are happening in Indian manufacturing. Contribution of the manufacturing sector to GDP is growing." says D Shanmugasundaram in an interaction with Manufacturing Today. He is the Managing Director of S&T Group and Vice President of TAGMA (Tool & Gauge Manufacturers Association of India), an all India association of the tooling industry.

Prashant Sardeshmukh, Managing Director, MMC Hardmetal Pvt Ltd; a leading supplier of metal cutting tools and related services would know.

"With the 'Aatma Nirbhar Bharat,' and the 'Make in India' campaign, the die and mould industry is growing rapidly in India. With the current geo-political situation, most of the customers world-wide are looking for solutions from India," says Sardeshmukh. And, "We all are going to benefit from it," he adds emphatically.

Prabhakar drafts the picture of how tooling will look in the future with these benefits that automatic tooling management delivers.

"In the future, we can look at digital tool management systems not only providing the right tools but also recommending optimum machine performance parameters. There would be highly connected and integrated systems enabling data driven decision-making through sophisticated algorithms and machine learning," says Prabhakar.

"The future of automated tooling management systems lies in their potential to further optimise tooling usage through data analytics and artificial intelligence. These systems will continue evolving, offering tailored insights for specific shop floors. Integration of AI and Machine Learning will enable precise optimisation, making these systems integral to a data-driven and efficient manufacturing future," opines Raina.