



AUTO MODE

AS THE WORLD MOVES TO AN 'AUTO' MODE, IT IS BUT NATURAL THAT THE MANUFACTURING SECTOR IS MAKING A SHIFT TO ADOPT AUTOMATION AND ROBOTICS LIKE NEVER BEFORE.

BY BINDU GOPAL RAO

WHILE AUTOMATION WAS ONCE SPURNED

due to the large amount of human resource in the country, today this is changing. Progressive ministers in the Indian Government actively agreeing to initiate automation programmes and a robotics movement by bringing in advanced technologies has largely contributed to this shift. In addition, India wants to remain competitive globally and is therefore increasingly looking at automation and robotics to increase its competitiveness. There are huge opportunities in new disruptive technologies within automation and robotics.

DO THE NEW

The new form of robotics in the manufacturing space would be mainly focusing on the usage front (more ergonomically) or introduction of robots in manufacturing with ease of handling the same, which is more important so as to free human workers from dirty, dull, and fatigue-inducing jobs, and also to improve quality by eliminating errors, and reduce variability and to cut manufacturing costs by replacing increasingly expensive labour costs.

NS Madhusudhanan, senior manager, robotics

1. Robots are playing an important part in the modern-day shop floor.



business development, factory automation and industrial division, Mitsubishi Electric India, says, "Mainly the usage of AGVs, IIoT, AI, and sensors for predictive analytics to improve the business intelligence and also the automatic storage and retrieval systems, which plays a major role in supply chain management, is new. Also, the IIoT concept gives major space for understanding the condition-based maintenance, which in turn gives an ample opportunity to improve production."

Robots are playing an important part in the modern-day shop floor by optimising human resource utilisation through its multi-skilled abilities. This has made manufacturing of most intricate and complex geometries easy with improved productivity of more than 200%, complimented with higher degrees of quality in the most cost-effective manner. Robots are operated literally 24x7 and are effectively used in repetitive tasks and in high-risk hazardous work environments, for example, in the chemical industry, forging industry, tool & die industry and the like.

"Robots are now being designed to perform multiple activities/ jobs, while traditionally robots were performing dedicated operations stationed in a fixed location with a single distinct role. Advanced robots are now more mobile, multi-skilled, collaborative, coherent, coexistent and dexterous (replica of human hand). These robots are flexible, autonomous through self-learning, decision making and thereby are conducive to be used in variable environments. The advancement in sensor developments has made robots proficient in image/ object recognition to handle various shapes and sizes," explains **Vijay Anand R, practice leader - manufacturing engineering, QuEST Global**.

DEMAND DRIVERS

India is an upcoming potential market for the industrial robotics industry with a worldwide market share of approximately 15%. With suitable stimulation

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and investment in the key underlying technologies, a broad range of robotics activities can be enabled. Key to this is the identification of first-wave technologies that will drive early markets. Industrial robots form an essential part of the current manufacturing sector of India.

"Without the use of robotics technologies or cost-effective production, a pillar of emerging Indian wealth would not be possible. Furthermore, robot-based production increases product quality, improves work conditions and leads to an optimised use of resources. The miniaturisation of robotic technologies and newly developed sensing capabilities mean that these benefits are becoming applicable to an even wider range of manufacturing industries, including those with small and varying lot sizes, materials and product geometries. In industries, most of the tasks are being considered as dull, dirty and dangerous for human beings and, as such, utilising robotics and automation in these sectors would improve productivity, safety as well as the quality of the end product. Human operators can then take up more value-added roles in the industry. Robotics and automation has the potential to revolutionise the industrial scenario. It promises to bring the same result as computer systems have brought in services and other sectors," says **Satanik Roy, co-founder, HyperXchange**.

TECH TALK

Technologies like data sciences and analytics, artificial intelligence, etc. are proving to be growth opportunities for Indian companies in so much so that even start-ups are actively pursuing this path. There are challenges whereby old mind-sets need to change, new skills need to be encouraged and a way needs to be found to easily scrap redundant and obsolete technologies.

"Each country's legal system on robots will be different as it will need to factor the stage of robotics prevalent and the manner in which robots are per-



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ceived by the society and polity. A futuristic and forward looking vision is specifically important for India as robotics is still novel and its impact and consequences are yet to unfold. Developed jurisdictions have already started promulgating a separate set of legal and ethical codes for regulating robots. The approach has been to anticipate the impact that robots can have on human kind in the coming two decades. The deliberations involve all stakeholders and the objective is to devise laws which not only promote robotics, but also balance it with the best interests of humanity. India needs to follow suit, failing which it will have to replicate foreign regulations that can stifle the promises that the fourth industrial revolution beholds," avers Roy.

A convergence of rapid technological advancements has led the manufacturing industry to the brink of a new era, presenting what has been hailed as the fourth industrial revolution. This new era is defined by unparalleled machine intelligence and connectivity, introducing cyber-physical systems and IoT on the factory floor.

"Flex is leading the revolution that is transforming the way things are made. Flex's modern manufacturing initiatives are powered by advancements in Machine to Machine (M2M) communication; smart automation; 3D printing & additive manufacturing; augmented & virtual reality (XR); and enhanced visualisation & advanced simulation. The next generation of automation enhances big data analytics and insights through feedback sensors in robotic assembly, enabling customers to monitor detailed information for each product unit produced. A good example would be Flex's innovative Universal Box Build Automation System. Flex pioneered the first-of-its-kind Universal Box Build (UBB) system, a fully-automated, state-of-the-art equipment outfitted with Internet of Things (IoT) connectivity via smart sensors, actuators

and cameras," says **Sekaran Letchumanan, VP of operations, Flex India.**

OVERCOMING OBSTACLES

Robotics has opened burgeoning opportunities, but there are still many challenges that this field faces in an Indian scenario. In India, the need is to come up with a world-class product in the robotics industry with deep specialisation in server engineering, electrical, embedded programming and mechanical engineering (with a focus on design, manufacturing and materials).

"Someone wishing to get into the robotics industry must have a wide variety of skills and a thorough understanding of system control along with system integration and those who are passionate about robotics from any field of engineering can be a part of a team working on a particular robotics project. Sectors that are best suited for the adoption of robotics are those with large volumes, frequent demand spikes or prone to frequent audits/ quality checks. Also, industries where the volumes are huge enough to occupy large real estate are also prime candidates for robotics. This makes automation ideal for sectors like retail, pharma, e-commerce, automobile spares and engineering tools. Having said that, robotics is applicable in almost all sectors that need to store, assemble and transport physical products. DIY robots and UAV research platforms are the need of the hour to make robotics more popular in India. Forecasting the adoption of robotics in India in the future, due to globalisation and high industrialisation, robotics in India is poised for a bright future. Considering that India is already a manufacturing hub catering to the whole world, the use of robots in every aspect of manufacturing will provide the necessary edge to companies," says Roy.

In turn, this will propel the requirement of skilled manpower for this technology. Modern robotics en-



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gineers are confronted with the task of developing machines that interact with their creators in modes of increasing compatibility.

ADOPTION MATTERS

However, many developing nations including India are still to adopt robotics and automation in a big way. Considering the gap and opportunity, industries are rapidly going for automation with its different advantages and thus have given a great stress on robotics as an integral part of their innovation centres in the industries itself. They are investing a huge amount on the design and development technologies associated with robotics. Industries like Thinklabs, robosoftsystems, iRobot, PARI robotics and many more are actively pursuing innovation, development and implementation projects in the field of robotics. The adoption of robotics has increased now with lower pricing of products available nowadays, but the challenge would be handling of the same, where the ease of programming plays a major role and there should be a disciplined way of learning, which should be accepted in the manufacturing practices when it is implemented, else it does not give the actual required output.

"The planning is more important and we need to adopt certain discipline to introduce robotics. There is a myth that if we introduce robotics, the production gears up increasingly; this is not true, rather

THE ADOPTION OF ROBOTICS HAS INCREASED NOW WITH LOWER PRICING OF PRODUCTS.

the process gets stabilised and the utilisation of the equipment and the system gets optimised," avers Madhusudhanan.

Roy adds, "Barring a few regions and technological/engineering institutes in India, robotics as a subject is not taught well to engineering students. There is the absence of hardware companies that can cater to the industry and dependence on countries like China, USA and those in Europe to procure the necessary components is a major stumbling block."

The robotics market is growing at 30% for the last two years and would only increase, going forward. Of course, the end user has to adopt this new technology to help lead to better manufacturing practices. **MT**

FILTER WITH SERVICE INDICATOR

Janatics recently added an Air Filter with Service Indicator to its product range.

In pneumatics, the operating pressure is one of the major criterion for end performance. The reduced output pressure due to obstruction in the air flow could affect the end performance.

Air filter is the product which removes the dust particles, water particles etc. from the compressed air. The filter element has to be changed/ replaced periodically to ensure the air flow and the pressure is maintained in the system to achieve the end function.

Air filter with service indicator indicates the condition of the filter element. If the filter element is clear then the air flow and the pressure is maintained at the desired level. In case the filter element is dirty and choked, the air flow and the pressure is restricted, thus resulting in low-end performance.

- Green colour indicates the filter element is clean. The air flow is smooth and the pressure drop is well within the limit.
- Yellow colour indicates the filter is choked. The air flow is restricted and the pressure drop is beyond the limit.

- Red colour indicates the filter is dirty and choked. The air flow is fully restricted and the pressure drop is above 1 bar. At this stage, the end function would get affected because of high pressure drop.

These colour indications will alert the user about the conditions of the filter element as mentioned above for further necessary action (i.e. cleaning/ replacement of the filter element).

Air filter with service indicator is available in the following sizes:

- Air filter with gauge type - 1/2", 3/4", 1"
- Air filter with indicator type - 3/8"

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