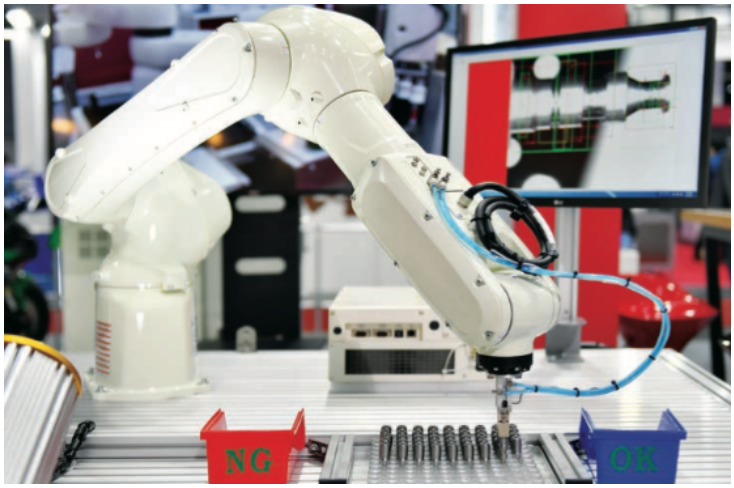
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Lab Automation Travails in India

02 July 2021 | Views | By Dr Manbeena Chawla

With increasing advances in machine learning (ML) and artificial intelligence (AI), digitisation in the research environment is set to become an integral part of every laboratory worldwide. But in emerging markets such as India, there are a large number of factors responsible for its slow adoption such as lack of skilled workforce, high maintenance and service costs, limited expertise, data security etc.



The process of turning analog information into a digital format has taken over many aspects of our lives whether in the form of bank statements or medical records. Similar is the case with science. All over the world, researchers are swapping their pens, notebooks, and sticky notes for digital technologies such as Electronic Lab Notebooks (ELNs), Scientific Data Management Systems (SDMSs), Laboratory Information Management Systems (LIMS), and Manufacturing Execution System (MES) etc.

Whether it is the industry or academia, life sciences workers are gradually accepting the fact that lab data digitisation improves processes, simplifies workflows and makes research and development (R&D) more efficient. With increasing advances in machine learning (ML) and artificial intelligence (AI), digitisation in the research environment is set to become an integral part of every laboratory.

The global lab automation market was valued at $4.57 billion in 2020 and it is expected to reach a value of $6.67 billion by 2026, at a CAGR of 6.6 per cent. Particularly with the recent outbreak of the COVID-19 pandemic, there has been an increased pressure on the laboratories to increase testing labs' capacity and speed. With the increase in the number of samples being tested every day, the lab automation space has been witnessing a growth in the developments of digitised systems by vendors, which is expected to create opportunities for the market’s growth.

Moreover, laboratories often face pressure to produce faster turnaround time, while also reducing errors to enhance patient care and therefore are using automation and robotics pervasive in clinical laboratories. The high-end automation in instruments and modular systems offers an array of features that are extremely user-friendly. Most of these instruments can be integrated with IT to maximise the benefits of laboratory automation, which offer mechanised solutions in each phase of workflow in a lab.

Thus based on the end user, the concept of lab automation is likely to penetrate effectively across a range of industries in the coming years, such as biotechnology and pharmaceutical companies, hospitals and diagnostic laboratories, research and academic institutes, forensic laboratories, environmental testing laboratories, food & beverage industry, to name a few.

"We foresee growth in automated room disinfection technologies due to their key advantages over manual disinfection such as even and consistent distribution of disinfectant across all exposed surfaces; process repeatability with validated high level sporicidal efficacy; less facility downtime and reduced labour requirements, freeing up operators to work on other tasks. However, unlike manual cleaning there is an upfront investment for capital equipment to perform automated room disinfection, and time is needed, albeit brief, for installation and commissioning of integrated equipment”, says John Chewins, Senior Regulatory Affairs Manager, Bioquell, UK.

Lab Automation Market Dynamics

The total lab automation space is spread across a number of equipment and software such as laboratory information management system, chromatography data system, electronic lab notebook, scientific data management system, to name a few. Out of these, laboratory information management system (LIMS) is expected to hold the largest market share in the years to come.

The software is not only used to manage and aggregate data from samples and automate workflows, it also helps in tracking the lots and reagents which helps in predetermining and understanding the required lab agents and resources. LIMS additionally offers various benefits such as integration with other in-lab systems, enabling smooth functioning and gathering data at a single place.

In clinical research applications, LIMS offers flexibility in the configuration of applications since clinical labs are often tasked with meeting specific regulatory requirements. On the whole, the inclusion of robotics and automation is becoming a major factor aiding the transformation of the clinical research industry. Subsequently, the application of lab automation is now spanning across many segments such as drug discovery, diagnostics, genomics, proteomics, microbiology etc.

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