



Press release

Total Lab Automation: an opportunity for the in vitro diagnostics industry?

In response to the needs of streamlined processes and increased productivity, the use of Total Lab Automation (TLA) systems is massively increasing in medical biology laboratories. Alcimed, a consulting company specializing in innovation and new businesses, set out to highlight the potential of these workflow automation systems and question the related prospects for actors' in vitro diagnostics.

Paris, December 7, 2018, Tighter control of healthcare expenditure, reduced reimbursements, increasingly required accreditations demonstrating the quality of service: all these factors compel medical biology laboratories to rationalize their activities. And while centralization of infrastructure is one of the first solutions provided in the last 15 years, automation is the second step. Total Lab Automation setups are now revolutionizing laboratory activity. By connecting analytical instruments with a tube conveyor, these systems transform the way laboratories operate, opening up opportunities for innovation for suppliers of diagnostic instruments.

TLA systems already embedded in laboratory practice

For several years now, laboratories have been massively investing in TLA systems provided by in vitro diagnostics companies. While mid-sized facilities (1.5 to 6M tests/year) often choose more limited setups, connecting only the clinical chemistry and immunology instruments, larger laboratories tend to invest in bigger systems or even in several parallel systems, integrating the hemostasis and hematology sections. In Europe, this equipment has mostly been adopted by university hospitals. In Germany, the United Kingdom and France they are generally equipped with a maximum of 2 TLA systems. In Italy and Spain large central "hubs" combining diagnostic facilities of regional hospitals are emerging, with sometimes up to 6 TLA lines in parallel.

The increase in productivity and the associated cost reduction remain the biggest drivers of the adoption of these robotized systems. In fact, one of the main challenges currently faced by laboratories is the pressure to increase testing speed in order to deliver results to the patients "in real time". As an example, since the installation of a TLA system in 2012, Nantes University Hospital significantly reduced its results delivery time and now processes nearly 90% of emergency analyses in less than one hour¹. The second benefit of workflow automation systems is the reduction of personnel costs. With only one technician required to control a line, the technical staff of the laboratory is reassigned to tasks with a higher added value. They can now use their technical know-how for: updating the control systems, line maintenance, or integration of new parameters.

Multiple challenges for in vitro diagnostics (IVD) players

For diagnostic instrument suppliers, the opportunity associated with this innovation was quickly replaced by the urgent need to upgrade. Indeed, although not all laboratories have decided to install TLA systems yet, they all agree on the fact that it is essential for certain instruments to be connectable to

¹ https://www.rochediagnostics.fr/Htdocs/media/pdf/publications/10000_Bio_89.pdf

such systems and so the choice of replacement for Immunology, Clinical Chemistry, Hemostasis and Hematology instruments is now frequently dependent on their compatibility with TLA systems.

In addition, the innovation prospects of diagnostic equipment manufacturers are also hindered.

For TLA system providers, an important side of automation is the associated computer system, or the middleware. This software, which ensures the control of all operations carried out by the TLA system, is an aspect not to be neglected, as it strongly influences the final choice of equipment manufacturer. The lack of flexibility of middleware configuration, repeated line blockages, and control issues are all criteria that laboratories take into account and that TLA system providers must meet.

The second issue is the line speed. Many laboratories reported tube bottlenecks on the line that prevented the timely processing of "emergency" tubes, this due to the insufficient throughput of analytical instruments compared to the tube conveyor. While setups equipped with lines dedicated to priority tubes are emerging on the TLA systems market, it is also on the side of the instruments themselves that innovation is needed. "Today, some of the laboratory's instrument suppliers are in a deadlock with the TLA market," says Marie Rolin, a project manager in Alcimed. "They cannot afford not to connect their equipment to the TLA systems, as then they will no longer be able to sell them; but at the same time their devices may have a flow rate that is too low compared to the rates of TLA systems. They are therefore faced with the following dilemma: is it better to invest in an often expensive "forced innovation" to develop a new PLC with a higher capacity, or rather to install a tube storage module next to the PLC on the line, an alternative solution that is certainly more favorable in terms of cost but not in terms of space occupied in the laboratory?"

This is because spatial adaptability of the lines is another major issue encountered by TLA equipment providers. Lack of space is in fact one of the first barriers to the adoption of workflow automation setups, as the costs of necessary infrastructural modifications frequently exceed the laboratories' investment capacities. Taking that into account, the modularity of TLA systems emerges as the key issue for future innovations in this sector.

ABOUT ALCIMED

Founded in 1993, ALCIMED is an innovation and new business consulting firm specialized in life sciences (healthcare, biotech, agri-food), chemicals, energy as well as in aeronautics, space, defense and public policy. Today ALCIMED works with major industrial groups, ETIs and SMEs, investment funds and institutional players. ALCIMED relies on a team of 180 highly-skilled individuals to help its clients in the exploration and development of their uncharted territories: New Technologies, Market Innovation, High-Growth Geographies, and Strategic Foresight. ALCIMED is headquartered in Paris and has offices in Lyon and Toulouse in France, as well as in Germany, Belgium, Switzerland, the United-States and in Singapore.

Alcimed is a member of CroissancePlus and the ACI (Association des Conseils en Innovation).

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