



Execution Excellence: Best Practices for Implementing Laboratory Automation

Execution Excellence is a business term used across many industries in which strategy, work processes, and people must be effectively aligned to successfully achieve business goals. In the context of a diagnostic laboratory, it refers to a flawless implementation of lab automation. The investment of time, money, resources, and staff utilization pays off with huge benefits including:

- Significantly improved efficiency and performance
- Much higher volumes with reduced turnaround time
- Lower cost and better staff utilization
- Greater and more consistent accuracy

“If you successfully define and implement the right automation solution for your lab, the results will be nothing short of transformational,” says Iris Jungherr, vice president of Automation and Diagnostics IT at Siemens Healthineers. “It systematizes and standardizes workflow to drive improved efficiency and maximum performance.”

How can you ensure a successful execution?

While every project is different, there are best practices that lead to success. Veronique De Vroey knows what it takes for successful implementation. As lab manager at UZA (Antwerp University Hospital) in Belgium, she recently oversaw the replacement of their existing automation with an advanced new system—most notably, the new automation was implemented in the same footprint as the previous track and without disrupting or shutting down their 24/7 operations!

Veronique De Vroey’s skilled leadership was a critical component of this accomplishment. Automating any lab involves many distinct tasks and objectives, depending on the lab’s specific requirements. UZA required uncoupling the instruments from their existing track; transitioning to manually managing workflow with the now stand-alone instruments; dismantling the track and replacing it with the new automation system in a tight space; and introducing new instruments and modules.



Getting Started

“As in any major project, when you decide to automate your lab, it’s crucial that your first step is to clearly define all your goals: strategic, financial, operational, clinical, and organizational. They should be specific, measurable, and, most of all, achievable. And don’t just think one or two years ahead. Consider expansions and updates that may happen five or even 10 years down the road,” says Iris Jungherr of Siemens Healthineers.

- Create a realistic and achievable timeline with very specific milestones and measurable criteria for success.
- Review the budget and return on investment so everyone can see the value.
- Excite and involve staff by showing how it will make their roles better.
- Get consensus and buy-in from all stakeholders, preferably in writing.

Planning the Plan

“Our initial meetings were held well in advance of the actual implementation and were quite important for us to organize our steering committee, core teams, and other departments that should be involved. Then we made sure everyone clearly understood their roles and responsibilities and our goals.” said Veronique De Vroey.

Goals can include:

- Define the objectives and scope of the project (and importantly, what is outside the scope).
- Manage the internal and external factors, opportunities, and risks that may influence the outcome of the project.
- Establish the frequency and form of communications.

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“The key elements for success proved to be having the right project team involved; continuous, open communication; teamwork; and very thorough planning.”

Veronique De Vroey
Lab Manager, UZA

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“We quickly learned that we are stronger together than alone.”

Veronique De Vroey
Lab Manager, UZA

In addition to your own team, automation projects involve outside contributors, vendors, and services. You should consider a consultant with expertise in automation, workflow, project management, and change management. This partner will be an integral core of your project leadership, so be sure to choose carefully based on their experience overseeing the entirety of such projects and their expertise and reputation for getting the job done right. Your project consultant will help you lead all the stakeholders, including your employees and outside vendors such as climate control, utilities, contractors, architects, and others.

“We bring all stakeholders through an extensive workflow consultation,” says Iris Jungherr in explaining the project management protocol Siemens Healthineers employs. “We analyze their current workflow and metrics, document their short- and long-term objectives, and apply time-tested best practices derived from extensive data analysis to make the right recommendations. Then we discuss their options and review the plan, and by doing so demonstrate that we can be trusted to be their partner through every step of the process. When a lab has all the information to make the right decisions, complexity is replaced by clarity.”

Preparing Your People

Training is a critical part of preparation for any new workflow, process, or system. It should occur throughout the lifecycle of the project, whether it’s to introduce a temporary manual process, bring lab technicians up to speed on the new equipment or software, or provide ongoing education after go-live.

Project Planning

From initial systems research to step-by-step transition procedures, the importance of detailed planning cannot be overstated.

Iris Jungherr agrees. “Labs usually begin their decision process by focusing on the hardware, guided by clinical needs and financial perspectives, and it is natural to want to jump right in on the installation. However, it is easy to overlook that this type of endeavor has many dimensions: equipment, construction, logistics, workflow, and people. This is the time to diligently plan every step of the project. This is where there is no substitute for experience.”

Do your homework. Planning begins by learning as much as you can about new equipment, systems, and processes. Read equipment manuals and literature. If possible, visit other labs with similar systems and learn from their experience and setup.

Set well-defined, measurable goals for your new automation. For example, your goals may include:

- Expand menu of assays.
- Increase volume.
- Increase revenue by adding services or offering reference services.
- Consolidate multiple labs into one core lab or move disciplines like hematology, coagulation, chemistry, or immunochemistry onto automation.
- Focus staff on more value-added activities.

Lay out the new lab. You don't want to automate a bad process, so be sure to optimize your workflow before sketching out your new floor plan. Work out several track configurations to achieve the goals you have set and work within the space restrictions you face. Consider future growth, and make decisions based on optimizing the lab's workflow to specific business and clinical objectives. Consider your existing instruments and IT and make decisions such as:

- Which instruments to keep, replace, or augment
- Whether to keep or replace existing middleware and other IT
- Future expansions: Planning now can prevent headaches and downtime

Outline the process, step by step. "We outlined the entire project, in a detailed phase-by-phase implementation," said Veronique De Vroey. "This included every step, from moving the instruments off-line, temporarily working with standalone instruments, dismantling the old track, installing the new automation, installing the new middleware server, and coupling all the instruments to the new track. Every step was detailed and documented."

Use tools to help plan. "This is a crucial step," Iris Jungherr concurs. "With so many strategic, operational, and performance goals set for your new lab, this is the time to ensure that what you are doing will achieve those goals." There are many tools to help you do this, including data from your existing operations and established business processes.

Some of these helpful tools include:

- **Lean Healthcare Principles:** A common-sense approach to measuring and analyzing operations, standardizing and continuously improving processes, and eliminating inefficiency and waste to achieve your goals
- **Six Sigma:** Tools and techniques for improvement of lab processes, based on a system of identifying and removing the causes of lab problems while helping to optimize the overall process
- **Key Performance Indicators:** Analyze metrics from your current processes
- **Simulation Tools:** Based on current and anticipated workloads to visualize and forecast future capabilities and performance

Getting It Done

Once all of your diligent planning is complete, it is time to put the gears in motion and begin the project.

Transition management: Keeping your lab operational. Some labs may be installing automation with all new instruments in a new lab space and therefore can keep the existing lab up and running until the installation is complete. Or, if you have the room, it can be business as usual in half the lab while the other half is being worked on.

For other labs, staying live 24/7 can be a bit more challenging.

"Moving instruments in the lab was like playing musical chairs," said Veronique De Vroey, "but we did have the advantage of duplicate equipment, so that for every instrument, we had another we could use for processing samples."

Considerations such as power, water, compressed air, drainage, or computer networking should not be taken lightly. Even if you are keeping existing instruments, if they move or work areas change, your previous utility connections may not be where you need them. Spend extra time to make sure everything needed is set up correctly for both final configuration as well as temporary locations during the transition process.

Proper software connection and integration is vital for proper functioning and full utilization of the new automation system. Secure support from your vendors and partners as needed throughout the process to assure proper and seamless interfacing and data migration.

Progress and News Updates are Critical



Daily 10-minute meetings with lab staff to keep them informed



Weekly meetings with detailed minutes and specific and dated assignments



Team reviews of each milestone achieved and next steps



E-newsletters to keep the user group and entire organization involved and informed

Whether your lab is automating for the first time or upgrading to a new automation system, information technology (IT) should be part of your planning from the beginning. Researching the capability and interoperability of your IT options is imperative. From your lab information system (LIS) to instrument and automation software, IT systems must work together to manage and optimize workflow, ensure quality, reduce errors, and accelerate turnaround time. IT solutions can even make intelligent decisions about analyzer availability and reroute samples as needed, while maintaining turnaround time.

Things to consider about your IT solution include:

- What connectivity is needed across the automation environment, and how seamless and integrated is the solution?
- Does it provide a centralized view of all workflow and productivity, or would your staff need to gather data from each individual instrument?
- Will it operate effectively across instruments from multiple vendors or multidisciplinary environments?
- Will it be able to centrally support a multisite environment?
- Can it scale to meet your growth plans?



Iris Jungherr
Vice President of Automation and
Diagnostics IT
Siemens Healthineers

Iris Jungherr is Vice President of Automation and IT at Siemens Healthcare Diagnostics. One part of her responsibility is leading the team managing the most complex laboratory automation projects.

Siemens Healthcare recruited Iris from Siemens Mobility, our transportation, logistics, and infrastructure division, where she successfully managed rail automation projects worth hundreds of millions of dollars, including the implementation of the project to automate the New York City subway system. During her 20 years in automation and information technology, Iris has held global positions in sales, marketing, and project management.

Iris holds a master's degree in Business Administration and Information Technology from the University of Goettingen, Germany, and she is a Siemens certified Project Manager for mega projects.

Steps to Success

Execution excellence requires aligning business goals, organizational strategy, and the performance of the team.

- Develop business, strategic, and clinical goals and align them to the project plan
- Engineer a solution to meet these goals
- Develop an implementation roadmap and project plan
- Manage the project and the people to adhere to this plan
- Stay on plan by tracking progress against established milestones
- After go-live, continue to measure and optimize

"In the end," Veronique De Vroey summarizes, "our project was so successful because we prepared very thoroughly, planned in detail, and had a very good team working together towards a clearly defined goal."

Iris Jungherr concludes, "Our discussion has presented some core ideas and insights to give you a starting point for a comprehensive and well-thought-out project execution plan with the right partner. There is no substitute for expertise and experience to achieve Execution Excellence."



Veronique De Vroey
Lab Manager, Clinical Pathology
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After completing her master's degree in Bio-Engineer Sciences at the KU University Leuven in Belgium, Veronique de Vroey worked for a biotech company (Tibotec-Virco BVBA), later acquired by Johnson & Johnson, where she became director of screening and diagnostic lab operations, managing a team of 80 scientists working on drug discovery and diagnostics for infectious diseases.

In 2011, she joined UZA (Antwerp University Hospital) where she currently holds the position of laboratory manager for clinical pathology. Her responsibilities include the daily operational management of the clinical diagnostic lab, serving as the liaison between the laboratory and hospital departments (technical, ICT, financial, and human resources). She is also the leader of the laboratory automation project.

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