

Checklist.

NEW TO AUTOMATION? 11 POINTS TO HELP YOU SUCCESSFULLY IMPLEMENT THE FIRST ROBOTS IN YOUR LAB

By preparing for the automation of your workflow by addressing these points and checking with the vendors, you can save plenty of time in choosing the right robot and getting it productive.

YOUR ASSAY

Understand upstream & downstream labware

Define your input. Are your tubes coming from a compound management group? A hospital? Is your labware barcoded? What type of barcode? Where is it placed?

Prepare for your output. Does another group use what is processed by your lab? Will what you produce be processed in another lab? Perhaps on an LC/MS or NGS system? How does this impact your labware selection?

Make sure the assay runs manually

Use the actual labware and test it without a robot. Looking to miniaturize? Make sure the assay works in that 384/1536 well plate *before* finally choosing a robot.

Show examples of the labware to your vendor. Maybe the tube has multiple layers of labels and that impacts what holds the tube. Maybe the lid is not automation friendly. If that's the case, you should test alternatives *before* finally choosing a robot.

Clearly describe the assay protocol

What steps take place? Be explicit and detailed. Don't just state 30 μ l in every well. Can you aspirate 360 μ l and dispense it 12 times? Or does it have to be single pipetted into each well?

How robust is the assay? What pipetting tolerances are acceptable? Knowing the limits of the assay will make the time necessary to implement a new assay finite.

What are the minimum and maximum incubation times? What amount of time can pass between assay steps? Having these constraints clearly defined in advance is always important, but especially critical in high-throughput assays when the automation handles multiple steps in parallel.

Upstream and downstream data

Does a Laboratory Information Management System (LIMS) control your assay selection based on barcodes? Does an Excel spreadsheet determine your pipetting schemes?

Do results need to be used on other platforms afterward? Be handed back to a LIMS system?

Define both before talking with vendors about appropriate options. Even better, prepare examples if possible. The more flexible your requirements, the easier this will be. But if there is a requisite data interaction or format, it is better to learn that before someone is installing a robot in your lab.

YOUR PEOPLE

Plan your people's time and responsibilities

Ensure your people have bandwidth at the time of the installation. There will be a period in the beginning that requires close attention and maybe some learning sessions.

Put someone in charge who has time. If the person responsible for getting the robot running is also responsible for 100% of your lab's daily business, your new robot will always be second or third priority.

Who is responsible for the informatics aspects of getting data to and from the LIMS? Are they internal/external? Will they support your project? Do you have to allocate some budget for their services?



YOUR IMPLEMENTATION PLAN

Plan time to develop & verify

Don't assume that because the spec sheet shows the robot can perform your assay that it will work out of the box. Specs are often based on specific liquids and setups. They prove the robot should be appropriate for the task, but do not promise plug and play capabilities.

Plan for a period of time after the installation to verify that the robot does what you need. Even if the vendor is executing these steps for you, it takes time.

Plan at least one round of troubleshooting when the first attempt fails. Often it is something small and easy to fix, but you will be frustrated if the expectation is that the system will immediately fulfill 100% of the dream on day one.

Keep it simple at the start

Start small and simple to verify that the robot can do what you need it to do.

Before trying overnight runs, try daytime runs when your team is nearby.

Before running 12 plates, try 1 plate runs which are easier to troubleshoot.

Be satisfied that you are getting robust results before scaling up throughput. Once the instrument is in regular use it may be difficult to find the opportunity to refine what it does. This is especially important in high-throughput automation.

YOUR LAB AND THE REGULATORY ENVIRONMENT

Is your lab in a regulated environment?

Your vendor can often answer questions about features that support compliancy with regulations, but ultimately adhering to these norms is your responsibility.

Understand which norms impact using an instrument in a compliant fashion (or find the person in your company who understands) and assess in advance of purchasing how automation fits in your processes.

Plan for the time it takes to generate the necessary documentation to use the robot productively. For example, does the process need to be validated?

Check & prepare your lab

Does the instrument need pressurized air? How big is it, in terms of dimensions and weight? Is there a special voltage requirement? Special environmental requirements (temperature/humidity)? How much space around the instrument needs to be reserved for airflow or walking?

Are your ceilings high enough? Your tables strong enough? Do you have enough space?

There's nothing more disappointing than getting the new robot and waiting a month for special work to get done before you can even turn it on.

EVALUATION AND RETURN ON INVESTMENT

Talk to other customers

Find unbiased information online, gather information at trade shows, ask for references of similar projects.

Ask present users what they like and dislike.

Ask them what surprised them during or just after the installation.

Ask them what they would be sure to consider before buying their next robot.

Set expectations properly

Making a capital equipment investment, especially if it's your company's first shiny new robot, is a sign of success and can excite everyone including top management. For those who haven't done your level of planning, they may expect the ROI to start on day one after the installation. That's rarely the case.

Ensure that everyone understands the implementation of the instrument will be done with purpose, systematically and successfully. Show them your game plan - it creates confidence in your approach. The ROI is real and significant, but it is often measured over years, not days. Keeping expectations realistic may be the #1 key to success.

