How to Buy a Laboratory Information Management System (LIMS)

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This article is intended as a concise guide for those looking for a LIMS, whether it is a small sample tracker system or a full function LIMS for a global operation, or anything in between. A fuller paper covering these points in more detail can be requested from the author. In case you think a LIMS isn't for you *Figure 1* shows the broad range of industries now using LIMS.

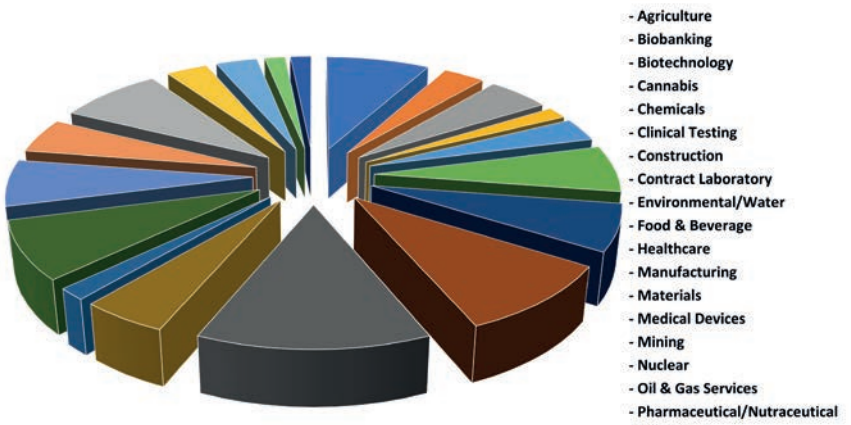

Figure 1: Industries purchasing a LIMS

1. Why do we need a LIMS?

This question is key to getting backing for the project from your senior management team. Listed below are some of the potential benefits of a LIMS that can form the basis of your cost justification. Don't limit the potential benefits to lab-based functions as a LIMS is potentially a powerful business management tool.

Example benefits:

- Speed up sample throughput by eliminating paper records and manual transcription of results into lab notebooks.
- Save time by automating laboratory workflows including the management of quality control samples, and approval by exception based on defined result limits.
- Automated data search removes time spent looking for paper-based records and speeds up data reporting.
- Automatic interfacing with MRP and other external systems speeds up production batch approval.
- Real time access to laboratory performance indicators such as workload by person, by instrument, by test, by customer etc.
- Elimination of errors by ensuring operating procedures are properly adhered to.
- Monitor sample timings and throughput to identify and resolve process bottlenecks.
- Track sample locations to ensure they can be quickly retrieved.
- Create a chain of custody for all samples including location and responsible person.
- Integrate all laboratory functions to increase productivity and traceability while maintaining quality of processes and information.
- Manage staff training and competencies, as well as instrument calibration and maintenance records.
- Link staff competencies and instrument records to lab processes, ensuring only qualified staff and instruments are used.
- Automated instrument data capture that eliminates manual intervention and transcription errors.

2. Setting out your requirements

Writing a requirements document is key to agreeing your needs and can be shared with LIMS suppliers. Ensure you include a broad cross-section of people in the team: laboratory users, IT, QA, Management, and other functions that should have an input.

Consider the following guidelines when creating the requirements document:

2.1 Overview - a brief overview of the laboratory, the testing it does, and key personnel involved.

2.2 LIMS Summary - define the key objectives and the productivity gains envisaged.

2.3 System Overview - Specify database preferences and hardware needs.

2.4 LIMS Technical Requirements – detail what is needed for each workflow step and any interactions with external systems (see *Figure 2*).

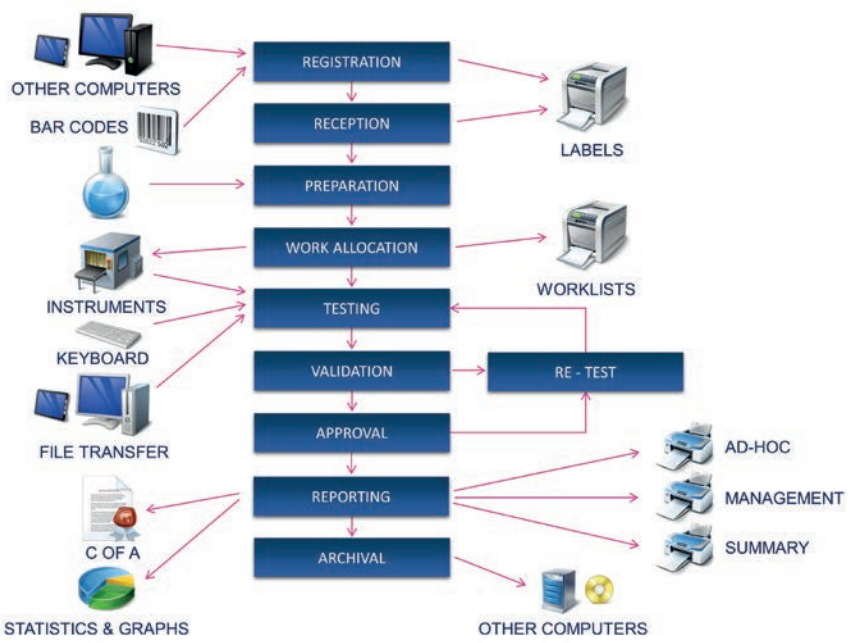

Figure 2: Typical laboratory workflow

A requirements document ensures internal agreement and enables suppliers to estimate costs.

3. Finding and selecting a supplier

Listed below are potential sources of supplier information:

- Web sites via Google search (i.e. LIMS consultant, 'LIMS' plus your industry)
- Specialised LIMS web sites i.e. https://www.limsforum.com/ or similar
- LinkedIn LIMS groups i.e. LIMS4U (just search with LIMS4U or LIMS as search terms)
- Trade exhibitions

The first meeting: A sensible approach here is to brief the supplier on outline requirements. A short overview demonstration could be useful at this stage. To get the most from this ensure you have a checklist of your minimum requirements, and all key areas of the organisation are represented, including relevant management. You may want to see a second demo with some of it configured to suit your needs.

4. Classes of software

Be sure you understand the type of LIMS software you are purchasing; you will likely be using it for a long time:

- Bespoke custom software – often written in-house or out-sourced to a software

development organisation. Common problems encountered are under-estimation of effort, difficulty in adapting as needs change and support issues.

• Out-of-the-box LIMS – fixed configurations that suit a particular laboratory or industry. The LIMS may not be easily adaptable, forcing laboratories to change their procedures rather than the LIMS. Some cloud-based solutions have fixed configurations with costs rising sharply if solutions need to be individualised.

• Configurable LIMS – many off-the-shelf commercial LIMS solutions are configurable. Many are configured by writing software to adapt the user workflow. Some have limited configuration via built-in switches to enable or disable parts of a screen or workflow. One or two have a built-in graphical editor (an example screenshot is shown in ***Figure 3***) that allow edits to screens or workflow via a WYSIWYG (what-you-see-is-what-you-get) graphical interface. Because the underlying software is unchanged by this type of configuration, changes do not require re-verification of software.

Figure 3: Example of a LIMS screen with good graphics

4. Reasons why LIMS projects fail

Points to consider ensuring success:

• "I am sure we talked about this before we placed the order!" – ensure it is written down in your requirements document.

• Ensure sufficient internal resource for project management and testing.

• Introduce change control - uncontrolled changes will add uncontrolled cost.

5. Customer references

After you have picked your preferred supplier, it is normal practice to speak to a reference that uses their system, preferably in your field. Ask about the quality of support they have received and their views of the supplier.

6. Support and maintenance

Support and maintenance are an essential part of your LIMS. Get information on upgrades and how any potential bugs are managed. Software from reputable suppliers is upgraded regularly. Releases will contain new functionality and support new technology as required. These releases prolong the life of the LIMS. In addition, maintenance releases may be issued to correct verified errors.

Ensure the suppliers support helpdesk is staffed by knowledgeable technical people. It is essential that you speak to, or can contact, someone who is experienced with the LIMS and understands your application as opposed to a call centre or self-help group!

7. Supplier due diligence

Remember, you are buying products. If their products are lousy, it won't be much comfort that the supplier has a strong balance sheet, or lots of money, including yours.

Of course, they should not be too small a company and must have a good track record. But even in a large company, support is often dependent upon the abilities and attitudes of only a handful of people. You are not necessarily 'safe' with a big company: If you are a small customer heads won't roll if your system doesn't go as planned.

8. Place the order

Hidden bits: Before you go ahead, make sure you know what the costs will be to get the whole system working or 'first year costs'. Separately, make sure you know any recurring costs, like support and maintenance.

You have to find a deal with which you are happy, but make sure the supplier is happy with it as well. Remember this relationship should work for years. Don't be the one that cares more about the discount than the detail.

When the big day arrives to go-live, the supplier should be on-hand to assist with any last-minute issues that may arise.

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Phil has over 37 years' experience in Lab automation. He foundered LIMS4U in 2020 and offers LIMS marketing, primarily via LinkedIn (having over 27,000 connections).