



## The Cloud Isn't Everything – De-mystifying Cloud Based LIMS

Without doubt one of the hot topics in Laboratory informatics for a number of years has been the use of the cloud for hosting Laboratory Information Management Systems (LIMS) and other lab-based systems. However, is the cloud and whatever cloud model is used or recommended (i.e., Platform as a Service, Software as a Service, Infrastructure as a Service or whatever other four-letter acronym someone comes up with) really the be all and end all of lab informatics?

### The Benefits of Cloud

The use of the cloud to host lab informatics solutions can have real benefits. These are well documented and include changing from a capital cost model to a recurring cost model if you choose to pay on a subscription basis, the reduced need for in house IT resources to support systems and solutions, the use of third party infrastructure, automatic and guaranteed updates of operating systems and cyber security software and, potentially, automatic update of the LIMS solution as new releases become available. In addition, having a web-based solution hosted in the cloud can make it easier to manage user access and make collaboration within and between organisations simpler. The cloud can also make it easier to access data from multiple databases making it easier for data scientists to analyse large data sets from disparate sources; a key to realising the value of your data assets. However, it is always worthwhile making sure that these benefits will be of value to you, and your organisation, and any potential risks are identified and minimised.

### Understand the Risks

Any organisation considering a cloud-based implementation must ensure that the hosting organisation can address any concerns they may have, or risks they have identified, about third-party hosting. Reputable hosting organisations will have no difficulty doing this. However, it is worthwhile ensuring that cloud service providers have the required high levels of physical and virtual security in place and the level of guaranteed uptime should be checked. In regard to uptime, organisations must also identify the levels of uptime they need; the higher the guaranteed uptime the more it will cost, so an informed choice needs to be made. Organisations must also understand how software upgrades are applied, especially to the solution itself. Depending on the model chosen some suppliers will dictate when upgrades occur, potentially limiting the time available for users to test, validate and be trained on the new software, and forcing an upgrade on the users when it is not wanted. One other key area to check is access to your data. If you choose to discontinue your relationship with the supplier, will you be able to get access to, or a copy of, your own data and what does the supplier do with the backups and copies of your system and associated data they may hold?



### Consider the Business Case & User Needs

In the end, however, the cloud is a delivery method for a solution and, no matter how good that delivery method is, the value of any solution lies in its ability to meet the business and data needs of the organisation and users. The key to realising the value of your data assets is ensuring that you are actually collecting the correct data and the data is consistent throughout the organisation. This data imperative must never be lost sight of. Therefore, when looking for a LIMS solution, in addition to deciding if a cloud-based solution is appropriate (and if so what flavour of cloud solution), what should you be looking for?

Many, many articles have been written about this over the years and while the basics remain the same, the inevitable changes that have occurred in the laboratory environment such as cost pressures, and workforce shortages and deskilling have brought about some alteration in these needs. The starting point for any LIMS solution must be a clear business case and defined user requirements. From here it becomes easier to select the LIMS solution that will best fit your needs and, while decisions about an on premise or cloud base solution will play a part in this, other factors must be considered.



Items to consider include:

- Does the LIMS need to help you meet regulatory requirements such as GxP and CFR 21 Part 11 using functionality such as electronic signatures?
- Do you work to defined standards such as ISO 17025 or ISO 15189 and if so how will the LIMS help you comply with aspects such as resource requirements and process requirements?
- Do you need to automate your preparation and analytical workflows to guide users through them step by step, meaning you will need Laboratory Execution Systems (LES) functionality?
- Are you subject to external audits, if so and if it is time consuming and difficult to find the required information, how can the LIMS help you to make this task simpler and quicker?
- Do you need to integrate your instruments with a LIMS to speed up the result gathering process and eliminate transcription errors?
- If you work in a manufacturing environment, do you need a LIMS to help you with traceability of raw materials and intermediate products to the final products?
- Does the LIMS need to help you manage documents and document versions such as certificate of analysis?
- Are your workflows and processes likely to change with time, if so, how easily can the LIMS adapt to these changes?
- And the list goes on, and on

The above is just a small selection of the considerations that must be taken into account when purchasing or implementing a LIMS. Each business and user will have different priorities, concerns and requirements which will inevitably change the list. Whether your LIMS is cloud based or not is, in itself, an important decision, but despite what is suggested in some circles it is not the be all and end all of LIMS selection. Always remember the business case, user needs, and data imperative.



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