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SELECTING AN ELECTRONIC LAB NOTEBOOK

7 THINGS YOU MUST KNOW

White Paper

DASSAULT SYSTEMES

Electronic lab notebooks (ELNs) are one of the primary scientific informatics solutions for helping scientists design, execute, analyze and report on experiments—but selecting the right ELN can be a challenge.

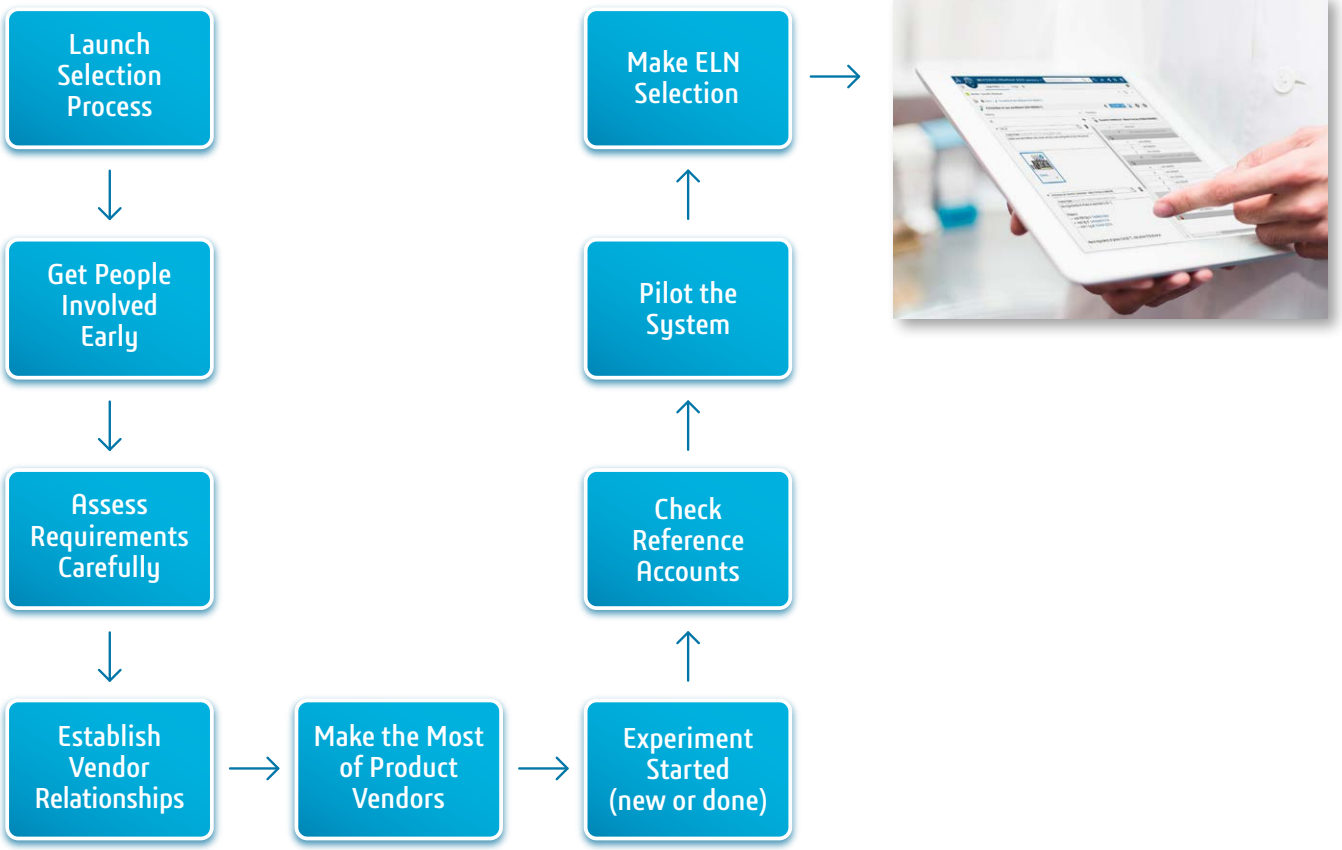
The right ELN strategy and solution can set your organization above the competition in terms of scientific information capture, workflow optimization, process consistency, IP protection, collaboration within global virtual teams and improved productivity through knowledge sharing.

In short, you're choosing a critical business application that will drive your R&D productivity for years to come. However, it can be difficult to tell the difference between supported and unsupported functionality, between fact and fiction, during pre-purchase demonstrations and other engagements with the ELN vendors you are assessing.

We've created the following tips to help you make a successful ELN selection. Rule number one: It pays to ask the right questions early in the assessment/selection process—during your initial pre-purchase engagements with vendors.

This is the time to ensure that the ELN you choose will maximize the value of the information you capture and scale to meet your cost, resource, performance and business requirements over the course of your notebook deployment.

ELN Selection Process



1: GET THE RIGHT PEOPLE INVOLVED EARLY

The lab notebook touches many people in a research organization, from lab managers through scientists and lab assistants working in multiple disciplines to virtual research teams, external partners, Contract Research Organizations, regulatory personnel, IP specialists, legal departments and IT groups.

While building consensus among diverse constituencies can be challenging, a diverse group of stakeholders can help ensure that the ELN you ultimately choose meets the needs of the organization as a whole. Large user populations also help fund large systems by spreading their cost across the organization. Likewise, it's important to involve departments that may wish to use an ELN in the future. The ELN you choose today also has to meet tomorrow's needs.

A corollary to this suggestion is: Communicate early and often with all affected groups during the ELN adoption process. The sooner all stakeholders are fully involved, the stronger your ELN specification is likely to be in the assessment/selection phase—and the better the buy-in during deployment.

2: ASSESS YOUR REQUIREMENTS CAREFULLY

The electronic lab notebook is the hub of your scientists' workday, the place where they orchestrate the design, execution, analysis and reporting of experiments. For this reason, listening to scientists and interpreting their needs correctly are critical activities in building the correct capabilities into your notebook.

Remember that the ELN is not necessarily the single solution for all your needs. In today's digitalized lab environment, scientists use numerous informatics systems to meet their needs including Laboratory Information Management systems (LIMS), Chromatography Data Systems (CDS), Document Management Systems (DMS) and Scientific Data Management Systems (SDMS). Integrating your ELN with systems such as these might satisfy your wish list more cost-effectively than trying to shoe-horn everything into the ELN. This can result in very complex, monolithic systems that adversely affect both adoption and Total Cost of Ownership (TCO).

As part of your due diligence for an improved ELN system, gather baseline data on your current notebook workflows and processes to determine which of these are general for all users as opposed to truly discipline-specific requirements. The general workflows and processes that the majority of your users will leverage in their day-to-day activities are the ones you will want to move to the ELN.

At this stage you should ask the fundamental questions about why you are implementing an ELN and what benefits you expect to achieve:

- Who will use the ELN system?
- What scientific workflows predominate?
- What is the impact of the workflows on other groups in the organization?
- What integration will be needed with other systems?
- Will the system be deployed locally or globally?
- Should you deploy a cloud-based or on-premises system?

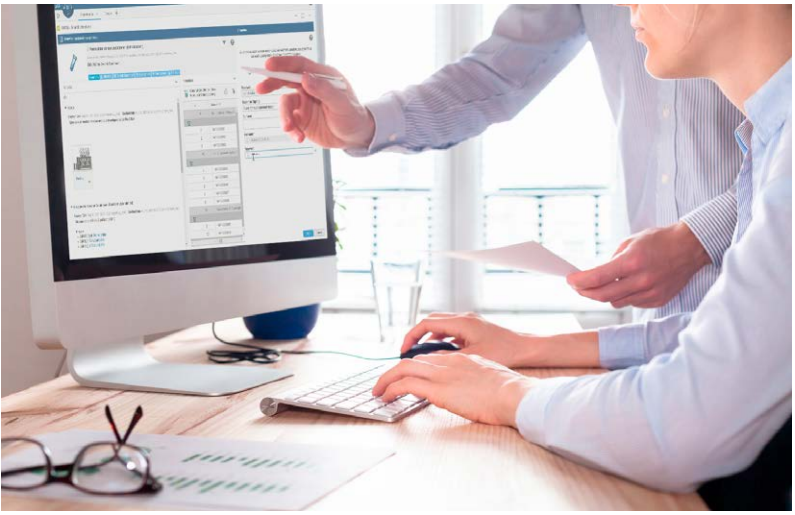
Answering these questions will help you define your expectations while also demonstrating the value of the new solution. Your answers can then be carried over into use cases, demo scripts, paper prototyping and a baseline system specification for presentation to candidate vendors.

3: ESTABLISH STRATEGIC VENDOR RELATIONSHIPS

Work with an ELN vendor that understands the broad goals of your entire organization, not just those of a single lab or project team. By understanding your overall informatics strategy and how an ELN can further your business goals, your vendor can ensure that your notebook integrates with LIMS, CDS, SDMS, and other expert tools including compound registration, decision support, inventory management and workflow orchestration systems. Such integration enables an information-driven R&D environment in which many scientific disciplines can effectively mine notebook-captured data.

Before inviting vendors to demonstrate their ELN capabilities, share with them the results of your requirements assessment. Invite vendors to your site to visit your labs, meet your scientists and understand your work processes. By developing a strategic relationship with your chosen vendor, you can actively influence product development and ensure that your selected ELN meets your overall information management needs.

4: MAKE THE MOST OF PRODUCT DEMONSTRATIONS



Avoid vendor-scripted demonstrations. Instead, develop your own use cases that spell out your requirements in detail. Then ask each vendor to demonstrate how their ELN meets and exceeds your stated needs. You also need to understand the level of effort it takes to meet your workflow needs.

In their zeal to wow scientists with near perfect demonstrations, vendors sometimes blur the line between out-of-the-box and custom functionality; likewise, it is sometimes unclear whether custom extensions are supported or not. During the demonstration, get the vendor to break from the script you provided. Find out what it really takes to set up the experiment they just showed you. Is the functionality or workflow they are showing you supported out-of-the-box or is it created using custom code? If the capabilities involve customization, how long will it take and how much will it cost? Very importantly, make sure the core use cases supported for your proposed system are also supported for other companies—and that they will scale to meet your future anticipated needs.

Fully understanding what custom extensions have been created and how they have been created for your demo will help you realize what potential, unanticipated costs you may incur during future upgrades. Most importantly, avoid any ELN in which the vendor has extended or upgraded core code just for you.

The creation of parallel code streams—not the best software development practice—leads to resource and logistical nightmares for vendors when supporting and upgrading software. A credible ELN system that cannot support a particular use case out-of-the-box should be able to offer it through a fully supported open Application Programming Interface (API) and software development kit (SDK). If the SDK cannot support your needs, the vendor should offer to partner with you to develop the requested use case functionality in future product releases. Vendor product managers should be prepared to work with your scientists to understand their current and future needs, ensuring that future product releases contain needed features in a supported, scalable and cost-effective solution.

The product demo affords an excellent opportunity to assess notebook capabilities in the following critical areas:

Ease of use and training

To ensure a low-risk, low-cost transition to your new notebook platform, look for an ELN with an intuitive, self-explanatory user interface that offers simple image, PDF, Word and Excel integration enabling all data and information to be easily captured using familiar tools. Ease of use translates into minimal training with minimal IT involvement—always major pluses in accelerating system adoption and optimizing return on investment (ROI).

Information capture and accessibility

Electronic lab notebooks not only optimize information capture, they also make captured information rapidly and broadly accessible to scientists. In selecting a notebook, it is important to understand how the application promotes the reuse and sharing of captured information. Is all captured information fully searchable? When the document repository gets large will it still perform acceptably and enable scientists to retrieve the information they need?

Extensibility, customizability of the system

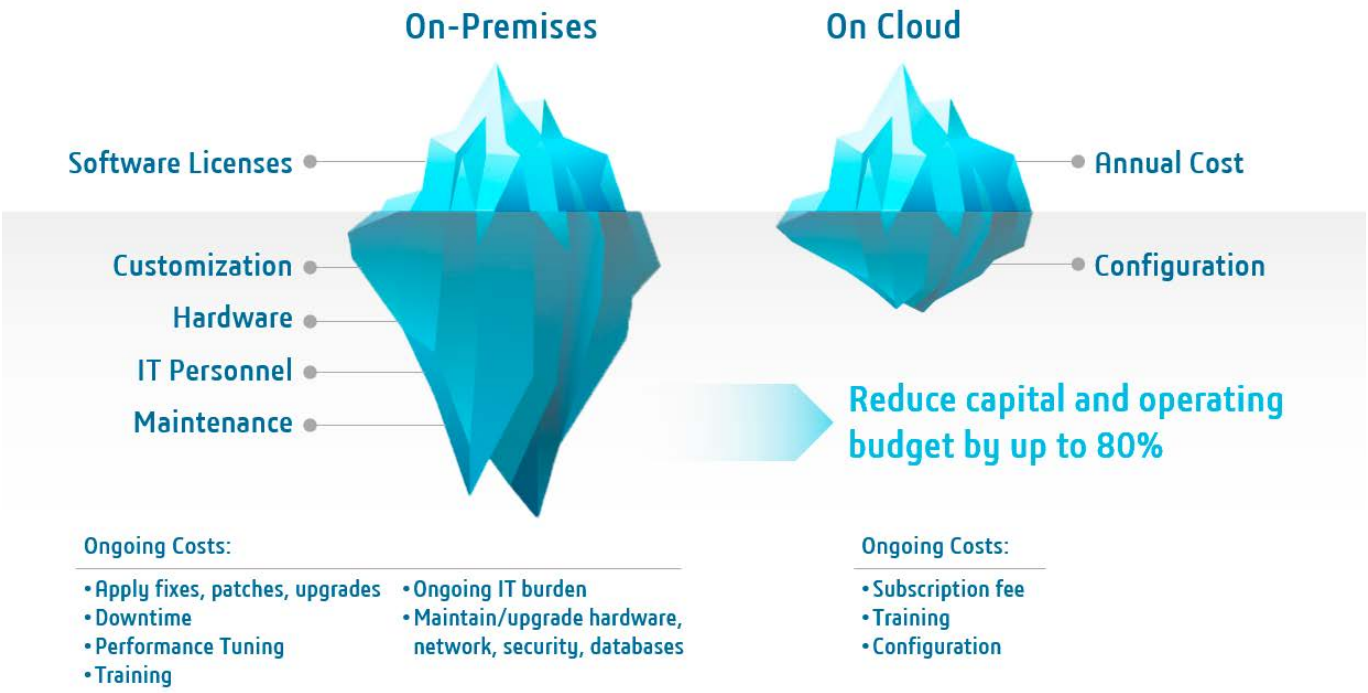
By supporting the easy, consistent capture of scientific information, electronic lab notebooks streamline the design, execution, analysis and reporting/sharing of experiments. Integrating laboratory instruments and software such as LIMS, CDS and SDMS into notebook workflows further enhances scientific productivity, making the ELN the central "hub" for driving experiment throughput. The challenge for vendors is assessing, prioritizing and integrating instruments and software applications. In selecting a vendor, it is important to understand what extensions are available today—and the effort and cost involved in supporting specific extensions required to drive productivity in your lab. Again, these integration extensions should be achievable through a fully supported SDK and not achieved by extending the core code in a "one-off" manner.

5: CONSIDER TOTAL COST OF OWNERSHIP

The software license fee is often only a small part of the total cost of ownership of an ELN. Never make a buying decision based only on the initial license fee or on a compelling set of pre-sales demonstrations.

Proper due diligence involves understanding exactly what you are paying for and any downstream project scope changes, schedule impacts and associated cost of ownership over many years.

Critical things to understand during the selection process include configurability vs. customization and ease of customization (when required). A highly configurable system will reduce the need for custom software extensions, translating into flexibility, agility and rapid response to your scientists' needs. Easy configurability also enables you to avoid expensive, resource-consuming IT development projects.



To support any required customization, the ELN you choose should be built with a well-known programming language in a stable, fully supported development environment. Always avoid "one-off" code changes and "black box" extensions created by the vendor just for you. These highly specialized customizations typically result in slower deliveries, longer deployments, more costly maintenance—and negative ROI.

With regard to deploying a cloud-based vs. an on-premises system, the cloud has become an excellent option for organizations of all sizes looking for rapid deployment/adoption, low TCO, fast ROI and easy collaboration within and across labs. The cloud is secure and requires no servers and database administrators, and can reduce related operating costs by up to 80%. ELNs deployed using on-premises servers provide most of the same benefits and are sometimes the preferred choice for larger organizations with existing IT infrastructures and organizations. Remember: The ELN is a business-critical system, so regular software maintenance, upgrades and backups are critical for on premises deployments.

6: GET FULL VALUE FROM REFERENCE ACCOUNTS

Customer references will play a critical role in your ELN vendor pre-purchase assessment. Vendors will share with you their most compelling case studies describing successful ELN deployments and impressive ROIs. The critical things to look for in reference stories are the pain points that may impact your own business downstream. Sometimes you need to dig a little deeper to unearth this information. Be sure to ask your reference accounts about their pain points and overall vendor experience.

Your own long-term ELN deployment and R&D productivity may confront the same issues. How you deal with them will ultimately impact your own customers and their perception of your ELN selection. When quizzing vendor references, be sure to ask the following questions:

- Were there hidden costs?
- Were there performance issues?
- Were there other post-implementation problems?
- What would they do differently the next time?
- How would they rate vendor support?
- How rapidly and successfully did the vendor resolve outstanding issues?
- How responsive was the vendor in configuring or extending the ELN to meet critical needs?

It is worth remembering that reference accounts will tout the credibility of their own organization and technology selection. There is always a tendency to communicate only the most positive feedback, and you should take this into consideration in your overall ELN and vendor assessment.

7: PILOT THE SYSTEM

Finally, provide the opportunity for key personnel to work with the ELN and put it through its paces. The best way to mitigate the risks of poor usability and deployment complexity is with a pilot installation that enables both scientists and IT to verify that the ELN meets your broadest possible technology needs prior to full implementation.

This pilot should meet three key requirements for your organization:

1. A "real-world" implementation at your facility to show the speed and ease of deployment for your scientific, laboratory and IT teams who will be leveraging the new ELN technology
2. A realistic user experience that demonstrates the ease of use and productivity gains to be realized upon full implementation
3. A set of performance and business metrics illustrating actual return on your potential investment (of both costs and resources) prior to additional commitment – a true "try before you buy" opportunity

SUMMARY

Selecting an ELN is a strategic commitment. Asking the right questions early in the evaluation process will help you better understand what is available in the ELN space today. It will also help you set realistic expectations both within your own organization and with the software vendors you are considering for this critical technology acquisition.

To achieve the most cost-effective deployment, your goal should be to select an ELN that meets the broadest technology and business needs across your organization. Forcing your notebook to handle every workflow in every discipline will only increase deployment complexity, ultimately slowing adoption, raising TCO and lowering ROI. After detailed product demonstrations narrow your choices to a select few ELNs, running pilot programs for the final contenders will enable you to see them in action and make an informed selection.

Fully understanding what is realistically achievable and deliverable is critical to the successful assessment, selection, deployment and maintenance of a notebook solution that will improve R&D productivity and collaboration, control costs and maximize your ROI.

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