



Better Documentation, More Collaboration with E-Notebook

Flanders, Belgium-based VIB is a life sciences research institute of 1500 scientists and technicians from more than 60 countries who perform basic research, with a strong focus on translating scientific results into pharmaceutical, agricultural, and industrial applications.

The entrepreneurial, public institute is committed to advanced technology investment to meet scientific challenges and aim for breakthroughs.

In 2008, VIB began evaluating electronic laboratory notebooks (ELNs) to replace paper notebooks. While the main goals related to better documentation, another driver was to increase collaboration among its researchers in more than 80 laboratory groups. Since 2009, PerkinElmer's E-Notebook has been the ELN of record at VIB, contributing to:

- Data capture and storage in one common system
- Greater data standardization
- Efficient data search, retrieval, and comparison
- Increased research collaboration and data exchange among VIB groups
- Less repetition of previously performed experiments
- Reduced time to create reports/publications
- Stronger IP position
- Better knowledge management

Better than Paper

Working in close partnership with five universities in Belgium – Ghent University, KU Leuven, University of Antwerp, Vrije Universiteit Brussel, and Hasselt University – and funded by the Flemish government, various granting bodies, and industry, VIB had been recording research results in paper laboratory notebooks. But its commitment to advanced scientific research led to a review of electronic solutions in 2008. Specifically, the institute sought to:

- Use best-available technologies
- Promote high standards for documentation
- Facilitate good documentation practices
- Share data and documents across its distributed labs

“Looking back, it’s not that people struggled with paper notebooks,” said Alexander Botzki, manager of the Bioinformatics Training and Services (BITS) facility at VIB. “But an ELN can help you be more efficient. We saw advantages in moving to electronic data capture.”

Thorough Evaluation

Convinced of electronic documentation's advantages, VIB's goal was to find a suitable ELN solution and partner. A panel of stakeholders – from VIB's Science Policy department, IT, finance and end users – developed a list of “hundreds” of requirements and questions for a public tender, inviting vendors to respond with potential ELN solutions. Four companies were then invited to demo their products in half-day hands-on sessions that enabled the project team to test the software. Additionally, the team checked customer references and sought the opinion of peers at other universities and institutions who were familiar with the various solutions.

From there, VIB's Science Policy department created a spreadsheet to weigh and evaluate the competing solutions across numerous categories and feedback. PerkinElmer's E-Notebook solution emerged the clear winner, based on a number of considerations, from competitive pricing to broad and configurable functionality, support, and company longevity.

Botzki noted that VIB was interested in E-Notebook's functional support for primarily biology, including the BioAssay module to support complex biology research workflows and data requirements. E-Notebook provided the custom-configurable functionality needed by various researchers investigating cancers, inflammation, microbiology, neuroscience, plant biology, proteomics, structural and systems biology, and more. “E-Notebook supports the collaboration within these research groups, within departments, and across multiple locations,” Botzki says.

Botzki and his colleague, Christof De Bo, the ELN application specialist who serves as E-Notebook promoter and helpdesk provider, said E-Notebook was first piloted in 2009 among five labs. After successfully training users and introducing E-Notebook, Botzki said VIB decided on a deliberate, phased rollout to the rest of the organization, beginning in early 2010.

The Rollout

As a decentralized institute with multiple locations, VIB contends with multiple computer systems, operating systems, multiple networks, and varied IT services. Even within labs, researchers adopt and change technology at different paces. VIB provides two ways of accessing E-Notebook; the local client installation for Windows users and a Citrix Portal for Mac OS X and Linux users. Currently both access ways are equally used throughout the institute. To ensure successful implementation of the ELN, VIB decided to centralize E-Notebook administration, providing a single point of contact for distributed IT and others. Botzki, as the initial ELN support person, and De Bo, who performs the function today, say they maintain strong relationships with IT for maintenance of the Citrix environment and administering accounts. They also move around across VIB to promote the use of E-Notebook, offer training, and assist with custom configurations.

Technology considerations aside, VIB also phased its rollout to accommodate human challenges. As an academic-based institute, the organization's annual turnover is 15-20 percent, while its monthly E-Notebook user base has reached 500,

requiring formal training of up to 200 people each year. De Bo in 2015 conducted more than a dozen introductory training sessions. Guided demos and general guidelines are available for users to cover the basics, as well as favorite tips and tricks. De Bo also visits each VIB department and individual labs regularly to promote the use of E-Notebook, answer questions, and enforce standards as appropriate.

Since completing the pilot in 2009, VIB has deployed E-Notebook to more than 95 percent of its labs, where it is used by 70-80 percent of all potential users. De Bo's goal is to reach non-users and wean them off paper lab notebooks.

“We got to 500 users because so many do find it cool to use,” he said. “But while many people find it's really cool and use it every day, some are still skeptical. We're working to help these people see the advantages of using the ELN.”

ELN Advantages

VIB credits its ELN deployment with numerous benefits for documentation – from better data capture, storage, search, and retrieval, to reduced reporting times, stronger IP, and greater data standardization. All its data is now in a common database.

“E-Notebook is a very good system for documentation,” De Bo states. “I would say, when I look at my new users, they learn very fast and are happy to use it.” Both he and Botzki added that they see a correlation between ELN use, good documentation, and results, noting that as scientists become better at documentation, they tend to produce better science.

When De Bo is introducing E-Notebook to new users, however, he also shows them how easy it can be to work with, how much more thorough a scientific record they can capture electronically, and how they can share their research with others. As De Bo and Botzki point out, researchers tend to think of their paper lab notebooks as personal possessions, while the ELN is “social.” To measure its contribution to collaboration, De Bo points to a significant increase in articles published by collaborative teams at VIB since E-Notebook's implementation. Not only did the number of articles increase, but the published papers demonstrated that more research groups were collaborating, both across VIB departments and locations, from Antwerp, Brussels, Ghent, and Leuven.

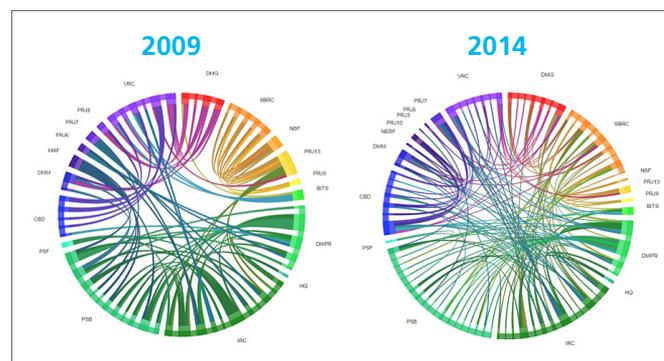


Figure 1. Graph of publications co-authored by members of collaborating VIB research groups. On the left is the network of collaboration prior to the use of E-Notebook and on the right after several years of implementing collaboration strategies including E-Notebook.

Advice for E-Notebook Deployments

- *Provide centralized administration:* At least for distributed organizations like VIB, having a single point of contact who is expert in E-Notebook is essential to successful deployment. Be active in promoting its use and available for training and troubleshooting.
- *Start with your early adopters:* Pilot E-Notebook with your technology enthusiasts and evangelists. Their early success builds confidence – and users who can promote the software to next users.
- *Train, but let users help each other:* Formal training is key to getting started, but users benefit from the experiences of other users. Encourage teamwork and peer-to-peer learning.
- *Be flexible:* VIB deploys E-Notebook via a Citrix portal, but with myriad computer systems, networks, and instruments – some the newest technologies and others older – it also enables local client access to address outliers.
- *Maintain your vendor relationship:* While VIB has internal E-Notebook expertise, it has maintained a partnership with PerkinElmer. De Bo shares E-Notebook experiences with PerkinElmer, as well as future requirements – and wishes. “We have a close relationship to make this successful,” he says.

“E-Notebook supports the collaboration within research groups, within departments, and across multiple locations,” said Alexander Botzki, Manager, Bioinformatics Training and Services at VIB. He noted that improved access to shared data and results stored in E-Notebook helped spur a significant rise in publications by cross-disciplinary teams of researchers from across the institute.