

# IT'S ABOUT TIME – AN ELECTRONIC LAB NOTEBOOK HELPS FOOD AND BEVERAGE COMPANIES INNOVATE

## HOW AN ELECTRONIC LAB NOTEBOOK HELPS UNLOCK EXISTING KNOWLEDGE TO SPEED INNOVATION

### USE CASE

Today's food and beverage companies are continuously seeking new ways to turn their expertise with specific ingredients and processes into something new that customers want. However, many are finding that customer demands are changing faster than ever. What's popular with consumers one week may change the next for reasons as divergent as the weather, a health recommendation, or a celebrity endorsement.

"It's not uncommon for a request to come in from a food service customer for a new chili, the new chef develops the recipe in a day, a small batch is tested, and the new chili is available to the food service client by the end of the week," says the project director at a global supplier of natural ingredients for the food, nutritional, pharmaceutical, and agricultural industries, and a BIOVIA customer. "That's how responsive we need to be. Menus change, diets change, restrictions change, and it is our job to help our customers keep up."

### ELECTRONIC PROCESSES SPEED FOOD & BEVERAGE INNOVATION

Food and beverage companies understand the benefits of storing information electronically, particularly the ability to share information rapidly across global sites. When product development time is counted in days and weeks rather than years, speedy access to what researchers have done and are doing helps organizations consistently and cost effectively deliver high-quality products that keep pace with consumer expectations. Scientists in the food and beverage industry are also increasingly realizing that paper based lab workflows are hindering their productivity and innovation. The process of printing out electronic data and pasting it into a traditional lab notebook has been described by many scientists as akin to "kindergarten art projects."



**"There are no restrictions on how the BIOVIA Notebook can be used or who can use it"**

R&D Manager, Business Operations,  
Global food R&D Company

**Challenge:**

Short product lifecycles requiring continuous, rapid innovation; capturing and sharing intellectual property (IP) efficiently; collaborating effectively across global sites

**Solution:**

BIOVIA Notebook

**Benefits:**

- Improved research efficiency with standard protocols and streamlined reporting improving focus on science
- Better global knowledge sharing with instantly searchable/shareable/reusable IP
- Rapid global rollout/deployment and training in less than a year
- Global scientific knowledge sharing and IP awareness

However, until recently Electronic Lab Notebooks (ELNs) have not been readily adopted by most food and beverage companies, which viewed the systems as weighed down by excess functionality geared for life sciences and required too much IT infrastructure and resources to support. "In the context of a billion dollar pharma project, it doesn't make a difference if there are ten IT people supporting a software implementation," the project director continued. "But that number makes a huge difference for a food and beverage company."

**FINDING THE RIGHT ELN**

So why move to an ELN now, given that their scientists have been documenting their research the same way for decades? Because food and beverage research isn't the same as it was back then. In an effort to improve laboratory throughput and efficiency, many food and beverage companies have invested in automation and lab instruments that generate data electronically. Ironically, this means that their scientists have had to print data out and paste it into paper lab notebooks for it to be appropriately signed and witnessed.

"It was double and triple work to document our intellectual capital," said one scientist. Another noted that it was also time consuming and a nuisance, particularly for scientists familiar with working electronically in other aspects of their business and in their personal lives. Modernizing research documentation helps ensure that research proceeds as efficiently as other aspects of the business, which are being continually retooled so that companies can maintain a tight focus on their bottom lines. Organizations can exploit many inherent advantages that electronic systems offer over static paper notebooks: better quality and readability, the ability to search the system, and the ability to hold data more securely than paper.

Another factor that has enabled food and beverage companies to adopt ELNs now is the maturation of the technology. Until recently, many ELNs were made exclusively for life scientists. But food and beverage research is diverse, occurring in fields and seed research labs where tomatoes and potatoes are bred and grown; in kitchens and dairies where recipes are developed, tested, and tasted; and in production facilities where new sauces, yogurts, and cheeses are created.

**BIOVIA NOTEBOOK - THE SECRET INGREDIENT FOR FOOD & BEVERAGE LABS**

Fortunately, the maturation of ELNs over the past decade has made flexible, low-resource, and easy-to-use systems available—BIOVIA Notebook is perfectly suited to the demands of food and beverage companies. "We're happy that pharma and life science invested in ELNs when they did, because all that effort has streamlined the systems and brought the overall solution cost down for the rest of us," said the customer's R&D manager.

The customer decided to deploy BIOVIA Notebook to replace paper notebook research documentation for their global research network. Since the implementation they have reported that BIOVIA Notebook has increased research efficiency and supported better global knowledge sharing and IP awareness. These benefits aren't just the result of going electronic; the unique flexibility of the BIOVIA Notebook means that they have rolled the system out rapidly—in less than a year—across globally dispersed research centers essential to the development of new food and beverage products.

"You'd think that just by virtue of being electronic, any ELN would be better than paper," the R&D manager continued. "But with some, you open them up and it takes 12 clicks to enter an experiment. Not with BIOVIA Notebook. You open it up, and with one click, you're in there, capturing ideas—as easily as turning a paper notebook page.

"We needed something that a chef could use, that a scientist could use, that an engineer could use, and that their managers could sign and witness she added. The BIOVIA Notebook offers a clean, user-friendly interface with an electronic "blank slate" that mimics a lab notebook page. Scientists work the same way they would work in a traditional paper notebook, writing text, making graphs or images and inserting them to support claims, writing a conclusion, and moving to the next experiment. The similarity of the system to paper means that different users can make it their own, with only one hour of training in system mechanics. Templates can be built and shared between researchers to standardize experimental protocols or streamline reporting, but ultimately researchers decide what their notebook looks like just as they would on paper.

"Some users put in recipes, some put the system on their lab bench and collect data directly into the BIOVIA Notebook, engineers use the system to document processes—there are no restrictions on how the BIOVIA Notebook can be used or who can use it," the project director reported.

In addition to being easy to use, modern ELNs are also easier to implement and maintain than the ELNs of the past. ELNs developed for life science and pharmaceutical applications can take years to fully implement and require dedicated IT staff to maintain. But this model is unacceptable to food and beverage companies, which don't have the resources or time to waste on long software implementations in areas like research that are tangential to the broader costs associated with operating the business. "We are not an IT company, so we avoid doing any systems development ourselves. We want off-the-shelf products that we can put to work right away," the project director continued.

The customer interviewed for this article needed less than a year to implement its BIOVIA Notebook—and that year encompasses the entire purchasing process, from evaluating solutions to rolling out the ELN to scientists. They also appreciated the BIOVIA Notebook's openness to different hardware platforms. Finally, scientists can learn to use the BIOVIA Notebook in just one or two hours of training. "When they said we can train your scientists in 60 minutes, we didn't believe it," said the R&D manager. "But they did. It was that easy to use."

### **BIOVIA NOTEBOOK SPARKS INNOVATION WITH SEAMLESS KNOWLEDGE SHARING**

Food and beverage development is all about agility, but organizations are becoming more reliant on extensive, complex networks of external partners across multiple geographies. "Our development time is short—a few months—and the life cycle of our products is short—usually a couple of years," said another team lead. Fast product turnover and short development times generate a substantial amount of data on product concepts as they are continually created and tested. But before implementing BIOVIA Notebook, there was no way to quickly or efficiently share this information because data was either locked in the pages of a paper notebook or stored in documents and spreadsheets on local servers.

Effective knowledge sharing is the main reason this customer wanted to shift from paper notebooks to an ELN. The ability to search experiments to see what has been done before enables every scientist to benefit from the collected wisdom of their corporate peers. Such insights can help not just with creating new products, but with troubleshooting product problems with customers; reformulating existing products to make them better, different, or cheaper to produce; or culling product concepts to focus on those most lucrative or productive. "There's a pattern in consumer products that a lot of the same ideas are tried over and over again," the R&D manager said. "We want to make the information needed centrally stored and accessible to anyone through a simple search."

Efficiency is a hard thing to measure, but when steps in processes are eliminated or delays prevented, research as a whole proceeds more quickly. For example, the BIOVIA Notebook has sped the creation of HPLC reports. Before the BIOVIA Notebook was implemented, analytical scientists had to wait to develop experimental reports until the chromatogram had run. Now, scientists simply pull up the BIOVIA Notebook on the same PC that is running the HPLC analysis. "They start writing the report and when the chromatogram is ready, they capture the image, pull it into their report, and write the conclusion," said the project director. "Writing these reports probably took an entire day before. Now, they are reporting information in near-real time."



Similar small efficiencies add up to big savings. For instance, signing and witnessing paper notebooks used to be so time consuming that some scientists neglected to get it done consistently. But electronic signatures have made the process easier. Automatic notifications in the BIOVIA Notebook inform scientists if a selected reviewer is unavailable, so that they can select someone different to review the notebook faster. Additionally, because the information is electronically stored, scientists can continue working while reviews occur, rather than having to wait for a physical paper notebook to be returned.

"When it comes to our overall knowledge of IP and capital, we're about 300 times better with the BIOVIA Notebook than we were on paper," said the R&D manager. "We're capturing everything from processes to tests to trip summaries in the BIOVIA Notebook." Critically, the captured information has more organizational value because it is searchable, shareable, reusable, and readable.

In short, BIOVIA Notebook plays a key role in helping food and beverage companies develop high quality products better, faster, and more cost effectively. It not only allows organizations to better manage their data, generating new innovations from historical data, it also streamlines operations to allow teams to respond to changes in the market more quickly. "Instantaneous access to all our corporate research data eliminates redundancy and enables our scientists to stay focused," concluded the R&D manager. "Because it's easy to check to see how and whether we've done certain things before, we can instead explore new ideas and put our scientists to work executing on those."

## BIOVIA NOTEBOOK STREAMLINES LAB OPERATIONS

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