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CASE STUDY

From Siloed Systems to Global R&D Acceleration: Cabot Corporation's Digital Transformation Story with Uncountable

A global specialty chemicals leader unlocks the power of connected data, machine learning, and cross-site collaboration to accelerate R&D and drive innovation across continents.

BACKGROUND

In 2020, Cabot Corporation, a global leader in specialty chemicals and performance materials, found itself at a crossroads. Despite being a science-driven company operating at the forefront of innovation across diverse markets, from battery materials and inkjet dispersions to rubber and adhesives, its internal R&D systems lagged the pace of its ambitions. "We were still on paper notebooks in some areas," recalled Dr. Patricia Hubbard, Cabot's SVP and Chief Technology Officer. "Others were using Lotus Notes or Excel. Data was siloed, unstructured, and in many cases, impossible to reuse effectively."

The lack of standardized, digitized data wasn't just a technical limitation; it was a strategic barrier. Every time Cabot attempted to launch a machine learning initiative, it hit the same wall: unstructured and inaccessible data. It was clear to Cabot's technology leadership team that a change was necessary — not just to improve operational efficiency, but to unlock the full potential for future innovation.

RECOGNIZING THE NEED FOR CHANGE

The desire for transformation predated Hubbard's arrival but quickly became a focus for the team. While Cabot had explored digital tools before, the efforts lacked alignment across teams and regions. The fragmented data landscape created redundancies, slowed down experimentation cycles, and limited cross-regional collaboration.

> ***"It wasn't just about implementing a tool,"*** Hubbard noted. ***"It was about transforming how we think about our data, that is, treating it as a strategic asset rather than just a record of past work."***

The Cabot team initiated a formal evaluation of lab data systems. "We created a cross-business R&D team, including scientists, R&D managers, and corporate Digital team members, to assess our needs. We also brought in adjacent functions that needed access to this data, such as manufacturing and commercial," Hubbard explained. The team outlined precise requirements: global access, internal and external data security, support for complex multi-step workflows, and the ability to build structured data systems that would also flex to dynamic research needs.

THE SEARCH FOR A PLATFORM: FINDING BALANCE IN COMPLEXITY

Cabot initiated an RFP process and invited multiple electronic lab notebook (ELN) providers to demonstrate their capabilities, and the team evaluated three primary contenders. The evaluation focused not only on features, but also on the ease of use, scalability, integration potential, and vendor partnership. One solution offered a powerful database but lacked the adaptability required for Cabot's wide-ranging R&D portfolio. "It felt like we had to change how we work to fit their system," said Michelle Shea, Lab Manager at Cabot. "That was a nonstarter."

> ***"We didn't want a solution that would require our scientists to conform to a rigid process,"*** Hubbard emphasized. ***"We needed a system that worked with us, not against us. That meant flexibility, modularity, and real responsiveness."***

Meanwhile, in Belgium, Alain Thielen, the EMEA Technology Director, had begun building an extensive spreadsheet-based management tool to bring standardization to plastics application development. "It took me hundreds of hours to develop, and while it helped, it was always a patchwork solution that was not robust," he said. "When Uncountable came in, I realized we could finally do this at scale, with the ability to connect globally."

The original vendor pool had focused on traditional ELN providers, which is why Uncountable, positioned as a broader R&D data and machine learning platform, hadn't been part of the initial selection. Hubbard was already familiar with the company from her time before Cabot and saw the potential for a broader platform that unified data capture, structuring, and analytics.

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> **Alain Thielen**
> EMEA Technology Director,
> Cabot Corporation

PILOT PROJECT: TESTING THE WATERS IN BATTERY MATERIALS

The Battery Materials business in Billerica served as the initial pilot environment. While another ELN pilot with a different vendor was underway elsewhere at Cabot, Hubbard wanted to see what Uncountable could do. She tasked a senior R&D manager and her team to partner with Uncountable and replicate their workflows inside the platform.

> ***"Uncountable's speed and responsiveness really surprised us,"*** the senior manager said. ***"They were able to understand our requirements, create structures, and roll out pilot functionality in weeks, not months."*** By mid-2020, it became evident that the Uncountable pilot was delivering more value and faster than the competing system. **"It was the flexibility without the chaos,"** Hubbard said. ***"We could impose structure while still letting people do the science they needed."***

The Uncountable team collaborated closely with Cabot scientists, refining templates, creating custom dashboards, and refining workflows based on real-time feedback. “The fact that Uncountable listened to our scientists and built around their needs is what made it work,” Hubbard added. “We tried other systems before, but they didn’t evolve with us. This was different.”

With greater visibility into R&D workflows and faster access to insights, teams were able to align more efficiently, reduce delays, and bring new products to market more quickly.

THE CATALYST OF THE PANDEMIC: ACCELERATING ADOPTION

When COVID-19 struck, many of Cabot’s scientists were asked to periodically work remotely to reduce the number of people in labs. While this transition created challenges for many companies, Cabot’s R&D teams, newly equipped with Uncountable, were able to maintain continuity of work with far less interruption.

That ability to work asynchronously reinforced the decision to move forward. “We realized this wasn’t just a system for managing today’s work; it was a backbone for resilience,” said Hubbard. "It allowed us to continue doing R&D in a disjointed world. That’s not something we planned for, but it became mission critical.” The company approved a comprehensive global rollout, beginning in late 2020, which now spans across their labs in the U.S., Belgium, Germany, China, and Japan.

During the initial phases of the rollout, Uncountable’s team worked closely with Cabot’s team to help clean up legacy data, align on shared naming conventions, and define lab-specific templates. Uncountable’s hands-on role in the process was pivotal in ensuring Cabot received top-tier customization, onboarding, and proactive support throughout the entire process.

LAYING THE FOUNDATION IN PEPINSTER

In Belgium, Thielen worked to bring his efforts to standardize data entry into a modern platform. “We mirrored our outputs with our colleagues in Shanghai,” he said. “It wasn’t just about uploading data, it was about ensuring that everyone was testing under the same conditions, using the same definitions.”

The change wasn’t easy. Some team members continued working in Excel. “There’s always hesitation with new systems,” Thielen acknowledged. “But we kept improving the templates, and over time, people began to see the benefit.” He was particularly impressed by Uncountable’s openness. “I was given admin-level access and could build exactly what I needed. And when I hit limitations, their team fixed it almost immediately.”

DRIVING EFFICIENCY IN ELASTOMERS: A CASE FOR ROI

In Billerica, Shea's elastomers team experienced what she called a "quantum leap." Processing dozens of batches per day and generating thousands of data points, each request previously required manual data entry into Cabot's homegrown database. "We had people spending a lot of time at computers," Shea said. "Now we have instruments feeding directly into Uncountable."

By eliminating manual data handling, Uncountable significantly improved Cabot's data accuracy and streamlined both processing and analysis workflows. Test data from instruments like those used for tensile testing now flows directly into the platform, reducing errors and eliminating time-consuming transcription. Combined with other instrument integrations, this automation has cut the time required to deliver test results to scientists and principal investigators significantly, accelerating decision-making and enabling faster iteration in R&D.

After implementing Uncountable, Shea calculated a significant return on investment: a single service request that once required over six hours of her team's time to enter data can now be completed in just three hours on average.

What's more, Uncountable improved accountability. "We can now see what's being tested, who's doing it, and where it is in the workflow," she said. "There's no confusion or lost time." Shea emphasized the reliability of support: "Anyone can sell you software. It's the support that defines the experience. With Uncountable, it feels like we're their only customer."

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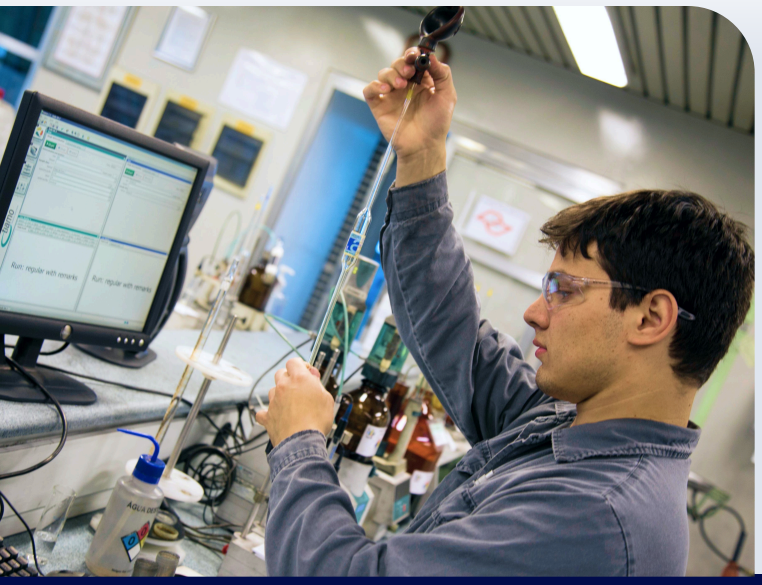
> **Michelle Shea**
> Lab Manager,
> Cabot Corporation



INTEGRATING HIGH-THROUGHPUT AUTOMATION IN INKJET

In the inkjet dispersions group, the team took automation a step further. Dr. Yuanxin Chen and Anthony Nguyen combined the Uncountable data platform with a robotic formulation system, enabling high-throughput execution of complex formulation studies.

This integrated workflow allows dozens of formulation runs to be executed in parallel, dramatically accelerating experimental cycles. Uncountable is used to design the experiments, manage the data, and apply machine learning models to extract insights.

"We use Uncountable to generate the experimental design, which we then export to the robotic system for execution," Chen explained, "Once the experiments are complete, the results are uploaded back into the same platform for analysis. Having everything in one place significantly reduces manual data handling and accelerates our research and development efforts."

> ***"Every day we generate a large volume of data from pigment dispersion experiments,"*** said Nguyen. ***"Before, keeping track of it all was a challenge. Now it's automatic, centralized, and easier to analyze."***

By tightly coupling high-throughput automation, data management, and machine learning, the team has established a scalable framework for faster, more data-driven inkjet formulation development.

STANDARDIZING BATTERY MATERIALS INNOVATION ACROSS BORDERS

In Zhuhai, China, a local engineer led the transformation for the Battery Materials Applications group. "We had teams in Billerica, Germany, and Zhuhai all working on the same chemistries," she said. "But our data was scattered in PowerPoint, Excel, and emails. It was a nightmare."

Uncountable allowed them to create linked experiment templates, track batches through multiple phases of testing, and visualize results in real-time. "We created over 10 uploaders for different tests — cycling, resistivity, viscosity, and rheology. Now, our technicians can upload files with one drag-and-drop," she said. "And managers across all three sites can see everything."

The result? Enhanced knowledge transfer, accelerated development, and increased transparency. The engineer added, "Now, we can actually manage battery development like a connected global process."

CULTURAL TRANSFORMATION & CHANGE MANAGEMENT: CHALLENGES & REALITIES

The road wasn't without bumps. Thielen acknowledged that some people struggled with the shift. "We saw comments in employee surveys that called Uncountable a 'barrier' to execution," he said. "But when you dig deeper, it's often resistance to change, not the tool itself."

Shea emphasized the importance of internal champions. "I made sure to not underestimate the impact this change would have on the lab and on the staff. I knew there would be growing pains, but I reassured them that we would go through this together, and they trusted my leadership to know this was a good thing."

And Uncountable's support played a role. "Sometimes I report an issue, and it's fixed before I finish the sentence," Shea laughed. "That kind of support builds trust."

LOOKING AHEAD: A PLATFORM FOR ONGOING INNOVATION

As Uncountable became embedded in the company's workflow, Cabot began to realize more strategic value from their data.

"We had a tire program where one scientist pulled six years of prior experiments and trained a machine learning model to uncover patterns and predict outcomes," Hubbard said. "It fundamentally changed the project direction. That wasn't feasible before." Thielen echoed the shift in mindset: "We're not just recording what we do. We're learning from it. We're building a searchable legacy of knowledge."

As Cabot continues to grow in areas such as electric vehicles, sustainable plastics, and next-generation printing materials, Uncountable will remain a foundational platform. "We didn't just buy software, we found a partner," said Hubbard. "Uncountable understood our science, our goals, and our urgency."

From a modest pilot to a globally scaled deployment, Cabot's journey with Uncountable proves that digital transformation, when thoughtfully executed, creates real competitive advantage for R&D teams.

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> **Dr. Patricia Hubbard**
> SVP and Chief Technology Officer, Cabot Corporation

CONCLUSION: BUILDING A FUTURE ON DATA-DRIVEN DISCOVERY

Cabot Corporation's story is more than a case study in modernization. It's a blueprint for what's possible when science, technology, and human insight align around a common goal: accelerating discovery through collaboration, transparency, and structure. By reimagining how data flows across teams, labs, and continents, Cabot has not only increased productivity but also empowered its scientists to innovate more freely and intelligently.

> ***"The success of this transformation is not measured just in hours saved or systems replaced,"*** said Hubbard. ***"It's in the way we now approach our science; with better tools, broader visibility, and the confidence that high-quality, connected data drives our decisions."***

With Uncountable as its digital backbone, Cabot has positioned itself for long-term success and future-proofed solutions poised to tackle the R&D challenges of tomorrow with agility, precision, and vision. This isn't the end of the story; it's the foundation of a more intelligent, faster, more unified future for innovation at Cabot.

Key Highlights & Stats

>50%
reduction in time from testing completed to results delivered to scientists and principal investigators

75+
instrument connections

~1635 hrs
of process efficiency improvements recognized within one lab across three years

About Cabot Corporation

Cabot Corporation (NYSE: CBT) is a global specialty chemicals and performance materials company headquartered in Boston, Massachusetts. With a history spanning over 140 years, Cabot is a trusted leader in delivering innovative solutions that improve performance across a wide range of industries, including transportation, infrastructure, environment, and consumer products. The company specializes in high-performance materials, including reinforcing carbons, specialty carbons, battery materials, engineered elastomer composites, inkjet colorants, masterbatches and conductive compounds, fumed metal oxides and aerogel. Through its commitment to sustainability, scientific excellence, and customer collaboration, Cabot helps companies worldwide meet their toughest challenges with advanced materials and deep technical expertise. To learn more, visit www.cabotcorp.com.

About Uncountable

Uncountable's AI-driven Laboratory Informatics Platform transforms how global R&D enterprises explore, analyze, and share scientific data, accelerating the pace of innovation. Our all-in-one, cloud-based solution modernizes and streamlines data management and analysis for R&D organizations, giving scientists, chemists, and researchers a single, web-based platform that comes seamlessly integrated with the most critical laboratory systems, including electronic lab notebooks (ELNs), laboratory information management systems (LIMS), product lifecycle management (PLM), quality management systems (QMS), advanced visualization and reporting tools, and more. Learn more at www.uncountable.com.