Cleveland Clinic puts its data to work for improved outcomes and more efficient processes.

Overview

- **Challenge**
  The Cleveland Clinic sought to strengthen its clinical, research and business decision-making by better leveraging its patient information.

- **Why Become an On Demand Business?**
  The Cleveland Clinic needed a way to pull together silos of patient data, unlock its intrinsic value and weave it into core processes.

- **Solution**
  The Cleveland Clinic engaged IBM Business Consulting Services to deploy the IBM Healthcare and Life Sciences Clinical Genomics Solution to access, analyze and share information wherever it resides.

- **Key Benefits**
  - Improved ability to predict, diagnose and treat diseases via realtime patient information
  - Improved ability to optimize operational decisions while maintaining strong outcomes
  - Reduction in time required to identify qualified research recruits from months to minutes

>> On Demand Business defined
"An enterprise whose business processes—integrated end-to-end across the company and with key partners, suppliers and customers—can respond with speed to any customer demand, market opportunity or external threat."

The Cleveland Clinic is a not-for-profit multispecialty academic medical center that integrates clinical and hospital care with research and education. Consistently named as one of the nation's best hospitals by U.S. News & World Report in its annual "America's Best Hospitals" survey, it is the second-largest medical group practice in the world and the largest hospital in Ohio. Pictured: The 12-story, state-of-the-art Crile Building.

Since its founding in 1921, the Cleveland Clinic (www.clevelandclinic.org) has strived to provide the highest quality patient care, guided by the principles of cooperation, compassion and innovation. Its consistent ranking among the nation's top hospitals is one measure of its success in achieving this goal. Another is the Cleveland Clinic's reach and reputation, evidenced by its treatment of patients from every state in the U.S. and from nearly 90 countries. A major part of its continuing success as an institution is an unwillingness to rest on that success, matched by a relentless drive to improve its outcomes, efficiency and the overall delivery of care.

"Using powerful, integrated technology, we can perform more efficient and focused research that will bring us closer to understanding the underlying variables associated with the disease. Ultimately, this will allow us to deliver better patient care."

– Kenneth Ouriel, M.D., chairman of the Division of Surgery and the Department of Vascular Surgery, The Cleveland Clinic

ON DEMAND BUSINESS™

On Demand Business Benefits

- Reduction in time required to identify qualified research recruits from months to minutes

- Improved ability to predict, diagnose and treat diseases via realtime, integrated patient information

- Improved operational reporting capability

- Improved ability to identify best clinical practices by bridging clinical, genetic and financial information

- Improved ability to optimize operational decisions while maintaining strong clinical outcomes

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– Kenneth Ouriel, M.D

In recent years, the Cleveland Clinic made a major leap in this direction with the deployment of a far-reaching electronic medical records (EMR) system. As it was designed to do, the system has streamlined the flow of information within the hospital and made key processes more efficient. But in addition to enabling a change in the *flow* of patient information, the EMR initiative has also transformed this information into a more strategic asset, a reservoir that can be tapped to affect even broader changes in its practices. The scale of this reservoir—the Cleveland Clinic has, for example, the largest vascular surgery electronic medical record database in the world—further amplifies its potential value as an analytical and decision-making tool.

Unlocking the data

The Cleveland Clinic recognized this value and was determined to capitalize on it, following a vision that was both broad and ambitious. In the clinical area, it saw the opportunity to identify at-risk patients based on their history and other patient-specific factors. To bolster its research, the Cleveland Clinic envisioned the use of patient data to identify underlying patterns in the causes of disease as well as the effectiveness of various treatments to optimize clinical outcomes. Optimizing operational outcomes—that is, the efficiency of the flow of money, materials and human resources that kept the hospital in the black—was also critical. To achieve this, the Cleveland Clinic sought to unlock the patterns and insights embedded within patients' billing and treatment data—and to mold those insights into its standardized practices. While much of the Cleveland Clinic's vision sprang from its deeply entrenched culture of innovation, it also represented a proactive effort to adapt to a more resource-constrained future. Indeed, with budget pressures likely to force the Federal government to pay less for clinical services and research, hospitals like the Cleveland Clinic will have no choice but to improve efficiency.

While its vast repositories of patient data provided the Cleveland Clinic with the building blocks for its data leveraging strategy, it lacked the "mortar" needed to pull the information together. Hospitals like the Cleveland Clinic are by their nature highly compartmentalized organizations, with departments having their own self-contained processes, systems and databases. While these departmental silos have long been considered a fact of life in hospitals, they are now emerging as formidable barriers to hospitals seeking to leverage information to improve their operations. For Kenneth Ouriel, M.D., chairman of the Division of Surgery and the Department of Vascular

Surgery and the chief proponent of this strategy, these silos stood squarely in the way of his vision. "There was a frustration of having so much valuable data sitting right in front of you, but being unable to touch it," says Ouriel. "We needed a way to pull that information together and unlock its value by weaving it into our clinical, research and business processes."

To meet this challenge, the Cleveland Clinic selected IBM's Healthcare and Life Sciences Clinical Genomics Solution. As part of its five-month engagement, IBM Business Consulting Services designed and deployed an integrated solution that would enable it to access, analyze and share information wherever it resided in the enterprise. In specifying the solution's key components, the IBM team defined the three most important functions it needed to deliver. First and most fundamental, the system had to bridge the gaps between the Cleveland Clinic's information silos, thus enabling realtime access to an aggregated pool of patient information. To deliver this, the team standardized the Cleveland Clinic's data model and used IBM DB2 Data Warehouse to create a consolidated, searchable database. To fulfill the second core requirement—a reporting and querying capability that was powerful yet intuitive for a broad base of clinical, research and administrative users—the team relied on a range of business intelligence products from IBM Business Partner Business Objects.

Finally, while having access to integrated information was a critical foundation, the system also needed to support the Cleveland Clinic's highly collaborative working climate by facilitating the secure sharing of information across the enterprise. For instance, doctors may need to collaborate on a complex diagnosis, while researchers may need to forward preliminary findings for deeper subsequent analysis. In these and all cases, the solution required a robust, role-based authentication scheme to ensure that the right people had access to the right data. To deliver this as well as seamless access to its applications, the Cleveland Clinic selected WebSphere Portal Enable for Multiplatforms. The entire solution runs on IBM eServer pSeries servers, chosen for their ability to support the rapid growth of users, information and applications with undiminished performance.

The benefits of integrated patient data

At the level of the organization as a whole, the Cleveland Clinic's initiative is the story of an enterprise trying to make better, more efficient use of its most important assets—its people and its information. The best way to look at the success of the project is to show how the many different parts of its operation have reaped such a broad and diverse array of benefits. Take research, for example. Before the project, researchers could spend months identifying a qualified list of potential recruits fitting a highly specific profile. Using the new system's powerful front-end querying tools, that task can be accomplished in minutes and with much higher levels of granularity. On the clinical side, the Cleveland Clinic is now markedly better able to flag patients at risk of

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developing deadly, yet hard-to-spot illnesses such as aortic aneurysms, as well as improving the effectiveness of their diagnosis and treatment. As Dr. Ouriel points out, these benefits are less about dollars and cents than gaining the ability to cross new thresholds of discovery. "We can now make quantum leaps in understanding that were impossible without an ability to see our data in an integrated way," says Ouriel. "In the long run, this will transform the way we allocate our clinical resources."

While medical and clinical breakthroughs are rightly held up as examples of the power of integrated patient data, the Cleveland Clinic is also looking to leverage its new system to optimize the many smaller decisions and practices that collectively impact its bottom line. For instance, by examining data on costs and outcomes for surgeons within a practice, department chiefs can identify—and promote—best practices within its surgical staff. Similarly, the new system gives the Cleveland Clinic the means to take a fresh, unconventional look at what had been relatively unexamined costs. For example, by analyzing "discretionary" clinical decisions—such as the type of hip prostheses used in a replacement procedure—alongside patient outcomes data, doctors can determine when more cost effective choices can be made without affecting the outcome of that procedure. "These kinds of small-scale optimizations add up to huge resource savings over the long term," says Ouriel. "To stay at the forefront, we have to embed more information into all of our decisions and practices."

Going forward, Ouriel sees the Cleveland Clinic's efforts to stay on the leading edge of information-based medicine paying off by continuing to attract patients from around the world, as well as world-class researchers. He cites IBM's own stature in the field as a big factor in its selection. "IBM brought scientists to the table that knew as much about genomics as our doctors to help us articulate our vision and to shape and pursue our opportunities," says Ouriel.

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