IBM Content and Predictive Analytics for Healthcare

Transform healthcare by putting data to work, revealing clinical and operational insights
Every single day, modern medicine delivers miracles. Across the world, millions of people benefit from routine medications, procedures and therapies that extend and improve life in ways that would have been thought impossible a decade ago—or pure magic a century earlier.

And yet, the healthcare industry is clearly in transition. For all its stunning successes, the industry still struggles with consistency. For example, 1.5 million patients in the United States are harmed annually by errors in the way that medications are prescribed, delivered and taken.1 At the same time, the industry is staggering under the burden of skyrocketing costs while an estimated USD700 billion is spent every year on administrative and clinical waste, fraud and abuse.2

The message is undeniable: there must be a better way. But that challenge also contains an opportunity for powerful and positive change. The key? Unlocking the transformative power of the vast and growing stores of information already at the fingertips of healthcare organizations so that they can make it accessible, driving more informed decision making and improved outcomes.

Despite the careful information collection practiced by healthcare organizations, a startling four-fifths of critical healthcare data is effectively left out of the decision-making process. This portion is the 80 percent of data that is unstructured:3 doctors’ and nurses’ notes, discharge summaries and more. Accessing and analyzing this form of information has proven to be arduous, time-consuming and—for most healthcare organizations—prohibitively expensive, resulting in it being omitted from critical decision making. In 2010, Enterprise Strategy Group reported that healthcare data will grow 35 percent each year through 2015, which will only exacerbate the problem.4

To help healthcare enterprises reverse this situation and take full advantage of previously untapped data to optimize clinical and operational decision making and outcomes, IBM introduces IBM® Content and Predictive Analytics for Healthcare. IBM Content and Predictive Analytics for Healthcare is designed to be the first solution to complement and leverage IBM Watson™, a groundbreaking IBM computing system that rivals a human’s ability to evaluate a hypothesis, learn from additional evidence and confidently respond to complex questions posed in natural language with speed and accuracy. IBM Content and Predictive Analytics for Healthcare is the first industry-specific analytics solution to enable organizations to analyze the past, see the present and predict the future by simultaneously applying multiple analytics services against the complete scope of their information.

IBM Content and Predictive Analytics for Healthcare helps transform decision making by combining multiple analytics services to derive insights in ways never before possible—enabling both clinical and operational workers to analyze and visualize trends, patterns and deviations while also modeling outcomes, understanding what factors influence them and taking advantage of opportunities to mitigate risk. As a result, IBM Content and Predictive Analytics for Healthcare empowers healthcare providers to turn insight into action for improved quality of patient care with reduced operational costs, inefficiencies and governance irregularities.
“IBM Content and Predictive Analytics for Healthcare uses the same type of natural language processing as IBM Watson, enabling us to leverage our unstructured information in new ways not possible before. With this solution, we can access an integrated view of relevant clinical and operational information to drive more informed decision making and optimize patient and operational outcomes. For example, by predicting readmission candidates, we can reduce costly and preventable readmissions, decrease mortality rates, and ultimately improve the quality of life for our patients.”

—Charles J. Barnett, FACHE, President/Chief Executive Officer, Seton Healthcare Family
Unlock insights trapped in underutilized information

IBM Content and Predictive Analytics for Healthcare is an integrated software and services solution that features multiple analytics services, support for healthcare terminology, solution-tailored delivery services and training (see Figure 1).

- **Content analytics**
  - Leverage and customize best-of-breed Natural Language Processing (NLP) technology to accurately understand text-based information
  - Create and visualize an evidence-based collection of analyzed information that reveals trends, patterns, deviations and more for 2D exploration
  - Detect discrepancies in structured data, such as misidentification of patient status
  - Speed time to solution value with the Healthcare Solution Accelerator, which helps providers extract medical facts and understand data relationships such as drug history and symptoms
  - Exploit powerful, scalable, open-standard Unstructured Information Management Architecture (UIMA) pipeline architecture
- **Predictive analytics**
  - Use predictive models, scoring and probability analysis to identify root causes and optimize outcomes
- **Planned integration with IBM Watson for Healthcare (future)**
  - Access trusted knowledge sources to confirm diagnosis and treatment options or seek new approaches

*Future optional capability*
Finally, IBM Content and Predictive Analytics for Healthcare provides knowledge workers and executives with powerful monitoring and reporting tools that present these trends, patterns, deviations, anomalies and other insights via dashboards and intuitive graphical interfaces. By enabling interactivity with the data through powerful, focused searches, the sophisticated visualization tools foster exploration of information in a new, free-form way—giving healthcare providers the power to uncover actionable clinical and operational insights that were previously beyond their grasp—ultimately enhancing patient care, treatment opportunities and outcomes; improving patient satisfaction; and helping to reduce costs (see Figure 2).

IBM Content and Predictive Analytics for Healthcare is compatible with the IBM Health Integration Framework, so it can take advantage of and interact with systems such as data warehouses, business intelligence, master data management and advanced case management—giving healthcare organizations the ability to realize more value from information system investments.

Figure 2: By offering insights that bridge clinical and operational environments, IBM Content and Predictive Analytics for Healthcare affects and enhances processes on both sides, turning insight into action.
Optimize clinical outcomes through greater understanding of information

By tapping into the full spectrum of available information, applying predictive analytics to discover impactful variables and using that knowledge to optimize clinical decision-making processes, healthcare organizations can enhance the overall quality of patient care through proactive intervention and enhanced diagnostic capabilities—all while reducing costs.

For example, doctors and other healthcare providers can use IBM Content and Predictive Analytics capabilities to identify trends, patterns and relationships in highly correlated patient symptoms—enabling them to make faster, more accurate diagnoses and treatment plans and intervene earlier, dramatically increasing the chances of positive clinical outcomes. Early intervention and targeted care can also shorten treatment durations and eliminate avoidable duplicate tests, significantly lowering costs and improving the patient experience. Equipping care providers with the population-specific knowledge needed to make more informed and personalized treatment decisions helps enhance patient care while facilitating regulatory compliance and mitigating risk.

Similarly, health plans and care providers can employ the combined power of the multiple analytics services in the IBM solution to accurately identify population-specific variables and groups of variables—examples might include smoking status, zip code, primary care physician or a combination of these—that are most indicative of outcomes such as avoidable readmission, successful clinical trial candidate selection or viable treatment options. This knowledge enables health plans and care providers to take early steps to intervene, reduce the cost of care and measure consistency.

Healthcare enterprises can also rely on IBM Content and Predictive Analytics for Healthcare to better understand the effectiveness of clinical treatments. By gathering patient-specific intelligence, organizations can personalize care plans, proactively reduce readmission rates, compare treatment efficacy against industry-wide outcomes, and make changes to optimize care coordination and focus resources on the most effective treatments.

Research organizations can exploit this same capability to support significant advances in studies of disease management. By extracting discrete facts from healthcare information—such as patients’ diets, exercise regimes and more—researchers can automatically augment their data with sources previously available only through manual research, gain greater levels of granularity and ultimately reach more well-informed, accurate conclusions—a benefit to patients and providers alike.

Streamline operational processes through optimized decision making

IBM Content and Predictive Analytics for Healthcare also provides significant advantages for healthcare providers at an operational level. One of the most important drivers of operational efficiency is quickly and accurately diagnosing and personalizing patient treatment the first time they are admitted, thus reducing the incidence of costly patient readmission. Similarly, by more effectively targeting and managing patient discharge and follow-up care, organizations can lower costs and prevent repeat visits.

One IBM customer is using IBM Content and Predictive Analytics for Healthcare to reduce the occurrence of high-cost congestive heart failure (CHF) readmissions. By utilizing
the technology’s predictive capabilities and natural-language processing functionality to determine elements that are most likely to result in readmission, and then extracting those key elements from unstructured historical data such as discharge summaries, echocardiogram reports and consult notes, this organization is able to identify CHF patients likely to be readmitted on a high-cost, emergent basis. By targeting these individuals for early interventions and care management programs, the healthcare provider is able to reduce costs, decrease mortality rates and enhance patient quality of life.

**Uncover powerful value**

At the intersection of these improvements in clinical and operational processes, a transformational pattern for healthcare organizations has emerged. IBM is helping healthcare providers evolve by revealing powerful insights in the high-impact overlap between clinical and operational processes—enabling low-cost, accountable care delivery that enhances the patient experience and optimizes outcomes, as well as improves operational efficiency within the organization itself.
For more information
To find out more about how IBM Content and Predictive Analytics for Healthcare can help your healthcare organization analyze and visualize the past, see the present and predict the future, visit ibm.com/software/ecm/content-analytics/predictive/healthcare.html

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Software Group
Route 100
Somers, NY 10589
U.S.A.

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