

Improve Patient Outcomes and Lower Costs with Predictive Analytics

Data-driven healthcare organizations gain insights for more proactive decision making by leveraging predictive models induced from clinical data sources

“Digitization has allowed us to have a more meaningful conversation around how to use predictive analytics to improve patient outcomes.”²

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National Coordinator for HIT in the
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Industry Strategic Challenges

The shift in healthcare from paper-based to digital workflows is giving hospitals access to a wealth of digital data. At the core of this transition are the adoption of Electronic Health Records (EHRs), which has been accelerated by various government programs¹, and digital transformation of the healthcare industry at large. This transformation is introducing new opportunities for healthcare organizations to fundamentally re-architect workflows to be more data-driven, dynamic, and patient-centered. Predictive analytics can play a key part in this process—helping healthcare organizations thrive through the digital transition, and establish more efficient workflows and higher quality operating models.

Healthcare experts agree on the enormous potential of predictive analytics to help identify patients at risk for chronic conditions, develop new protocols of care, forecast readmissions, and proactively identify potential obstacles to care plan adherence. It is also widely recognized that, when applied to intelligent staffing, billing optimization, and resource allocation, predictive analytics can improve operational efficiency. Given the relatively recent introduction of predictive analytics in healthcare, it is likely that some of the most exciting use cases have yet to emerge.

Implementing predictive analytics requires overcoming some common hurdles. To begin with, target data is often contained in different formats across segregated silos. Studies show that even within EHR systems, over 70% of data is unstructured.³ That data, like external data such as socioeconomic information, is typically ignored by traditional business intelligence (BI) tools. In addition, predictive analytics favor real-time systems, which requires evaluating data center, network and application architectures to ensure that system performance matches computational requirements. Finally, acquiring the expertise needed to not only develop predictive models but to integrate results into clinical workflows can be a barrier.

Despite these challenges, leading organizations are finding ways to implement predictive analytics to optimize care delivery and boost the bottom line. As the aging global population continues to strain access to care and healthcare systems shift from volume to value, the demand for data-driven decision-making tools is high—and the opportunity for predictive analytics in healthcare has never been greater.

Demonstrated Use Cases

- Identify patients at risk of preventable adverse events such as falls, and take appropriate action to improve safety.
- Establish proactive population health programs for patients with chronic conditions to improve health and reduce unnecessary readmissions.
- Identify early indicators of hospital-acquired conditions to preempt infections and reduce the length of stay.

PENALTIES HURT HOSPITALS



60.2% of U.S. hospitals lose up to 0.9% of their reimbursements due to hospital readmissions and preventable adverse events.⁴

- Anticipate the impact of external factors, such as weather conditions causing an increase in emergency department volume, and match resources (i.e., staff) to maximize efficiency and protect profit margins.
- Boost patient satisfaction and bottom line results through better clinical experiences and more accurate, streamlined billing.
- Optimize the revenue cycle by uncovering opportunities to accelerate cash collections and increase yield.



Digital Transformation and Business Innovation

As hospitals transition to digital workflows, they increasingly are taking advantage of the latest technologies to:

- Integrate structured and unstructured data into enterprise data warehouses or data lakes.
- Extract more value from investments made in EHRs and other clinical applications.
- Develop scale-out or scale-up analytics platforms to support a range of use cases.
- Shorten the time to move predictive analytics programs from proof of concept to production.



Integrating disparate sources of poly-structured data is foundational to developing comprehensive predictive clinical models.



Enabling Transformation

Intel is working with healthcare leaders and industry partners to develop cost-effective predictive analytics solutions built on scale-out and scale-up data platforms. These solutions include compute and storage technologies, along with optimized software, that make it possible to combine information from a wide range of sources for a more complete picture of patient health and risk factors. Latest-generation networking technology enables the results of predictive models to be delivered in real time. Predictive analytics solutions built on Intel® technology provide seamless data integration with performance, security focus, and scalability. These solutions are open and flexible, giving companies more choice of platforms and better control over costs as compute, storage, and networking demand grows.

Solution Summary

Through the use of sophisticated mathematical models, powerful servers, storage, networking, and optimized analytics code, this solution gives healthcare organizations the ability to analyze extensive amounts of poly-structured data in a scalable and cost-effective way. Predictive analytics built on this foundation can enable data-driven insights across a variety of clinical, operational, and financial use cases, leading to improved access to higher quality care at lower costs.

Solution Ingredients

- Intel® Xeon® E5 and E7 Processor Families
- Intel® Ethernet Adapters
- Intel® Solid State Drives
- Intel® OmniPath Fabric
- Intel® Math Kernel Library⁶
- Intel® Data Analytics Acceleration Library⁷
- Cloudera® Enterprise Data Hub

Strategic Solution Partners

- ProKarma*
- Cloudera

Intel Technology Foundation

Intel has pioneered the use of mobile compute, data center technologies, analytics and high-performance computing solutions that are enabling transformation of the healthcare industry today.

As technology barriers continue to fall and penalties associated with non-value-based care models continue to increase, predictive analytics solutions will play an increasingly important role in helping hospitals and their patients thrive. To find the solution that's right for your organization, contact your Intel representative or visit intel.com/healthcare.

¹ <https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/index.html?redirect=ehrincentiveprograms/>

² Healthcare Executive Magazine, volume 31, Number 5, September/October 2016.

³ <http://www.cmio.net/topics/analytics-quality/nlp-tackles-unstructured-data?page=0%2C1>

⁴ CMS FY 2015 Table 15B

⁵ <https://blogs.cdc.gov/safehealthcare/the-cost-of-sepsis/>

⁶ <https://software.intel.com/en-us/intel-mkl>

⁷ <https://software.intel.com/en-us/intel-daal>

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