

Inova Translational Medicine Institute (ITMI) brings precision medicine to life with Tableau and AWS

Analytics platform helps visualize and understand genomic data to enable personalized healthcare

Inova Translational Medicine Institute (ITMI), a division of the Inova Health System, conducts groundbreaking work in the proactive identification of biomarkers in newborn children. For over a decade, they've been working towards achieving their vision of healthier babies and adults through personalized, proactive, and precise treatment plans. As a part of the Inova Center for Personalized Health, ITMI is committed to the integration of genomic research with patient care, with a vision of creating truly personalized, predictive health care that anticipates potential health issues instead of waiting and reacting when a physical symptom appears.

It's the medicine of the future—but it requires a massive amount of computing power to bring to reality. ITMI's leaders realized that they needed an advanced analytics system to help deliver these results. ITMI had to capture large amounts of data from babies and parents—a complex task due the large amount of storage space required (a single human genome consists of just over 3 billion base pairs). From there, variations could be analyzed to create tailored healthcare protocols and forward-looking treatment plans for children across their lifetimes.

ITMI had existing business intelligence (BI) and analytics systems, but it was increasingly challenging to match them to the scale of the work. For example, it was difficult for a researcher or a clinician to run a quick ad-hoc report on a specific patient's record. The institute wanted to empower everyone in their organization with data.

The decision to use Tableau and AWS

ITMI knew that it had to quickly bring a powerful analytics system to life. The institute looked to Tableau and AWS to quickly deliver an industrial-strength enterprise healthcare analytics platform on the cloud that would power its innovative work. The institute wanted to deliver a single version of the truth and the actionable insights that would empower executives, researchers, clinicians, nurses, and analysts to make life-impacting decisions.

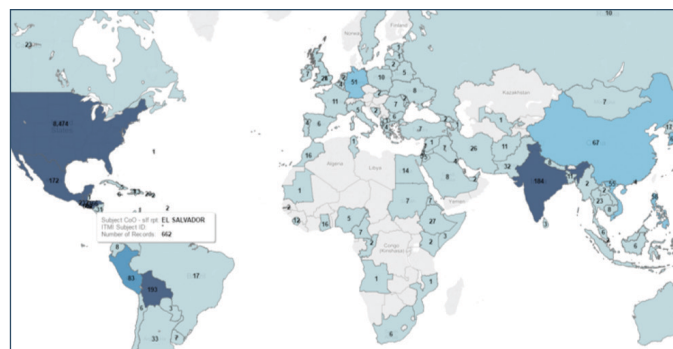


Fig. 1: Dashboard from an ITMI genetic diversity study visualizing subjects' country of birth. (Source: Inova Translational Medicine Institute)

Tableau for precision medicine

- Prepare and analyze large genomic data sets quickly and at lower costs
- Use geo-mapping capabilities to articulate the geographic implications of genomic variation
- Empower researchers to ask and answer data-driven questions without extensive training costs or specific data science expertise

Challenge

To move closer to the vision of precision medicine, a Life Sciences research organization needed an analytics platform to store vast amounts of biometric data. It had to integrate with existing electronic medical record (EMR) systems and meet stringent compliance requirements.

Solution

The institute utilized the visual analytics capabilities of Tableau on Amazon Web Services (AWS) to analyze clinical data, including human genomes.

Results

- Visual analytics help deliver new health insights intended to improve medical outcomes for children.
- The rapid and economical delivery of a dedicated healthcare analytics platform results in substantial cost savings.
- The integrated solution allows end users to gather, clean, and normalize data from disparate healthcare IT systems, at a lower total cost of ownership (TCO).

ITMI realized that building an internal infrastructure capable of managing the huge data volumes necessary for the work would have been cost-prohibitive and unwieldy. Also, any solution had to manage formidable data integration and industry-specific compliance requirements such as the Health Insurance Portability and Accountability Act (HIPAA). Data integration challenges are a particularly acute in the healthcare space, where there are over 100 IT and Electronic Medical Records (EMR) systems to orchestrate. The fundamental analytics challenge was to capture, cleanse, and normalize the data—and then turn it into a single version of the truth for researchers.

Tableau offers a flexible, intuitive, and easy-to-use analytics enterprise software platform. Without the need for large investments in consulting and training, Tableau rapidly delivers measurable cost savings and key performance indicator (KPI) improvements, and constantly responds to customer needs.

The work of ITMI is global in nature. The unique mapping capabilities of Tableau can help lead to data insights and offer the ability to articulate global origin implications of genomic variation. For example, genomic variation can be mapped to countries of origin, and this information can help scientists more fully understand a child's prognosis and recommend appropriate proactive protocols.



Tableau: Helping people see and understand their data

To turn opportunities into reality, people need the power of data at their fingertips. Tableau is transforming the way people use data to solve problems by making analyzing data fast and easy, beautiful and useful. Tableau provides:

- Powerful analytics that drive business value.
- Fast adoption at scale across all skillsets.
- Flexibility to leverage existing technology investments.
- A mission-critical analytics platform that embraces both security and compliance.

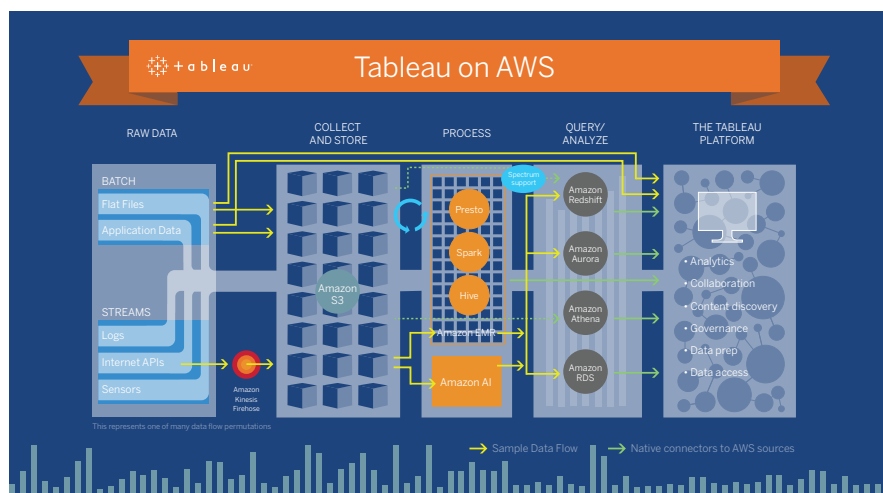


Fig. 2: Tableau uses multiple AWS services to move, access, and process data for visualization and analytics.

Tableau on AWS brings massive compute capacity and a cloud infrastructure that is robust and highly available. AWS provides many HIPAA Eligible solutions, enabling organizations like Tableau to create solutions that can help its customers meet stringent compliance standards.

ITMI: Data visualization built on AWS and Tableau

Using Tableau on AWS, ITMI realizes a compute capability that can be scaled easily. The built-in managed infrastructure allows ITMI scientists, clinicians, and analysts to focus on what they excel at: developing precision medicine and improving health outcomes for children. AWS meets the complex data integration and compliance challenges of the Healthcare and Life Sciences industries in a cost-effective way.

The compute power and capacity of AWS makes it easy to scale out without IT infrastructure investments. It gives ITMI the confidence that they can create an analytics platform to store vast amounts of data without having to build or manage the computing environment. AWS also integrates with existing EMR data repositories used by ITMI.

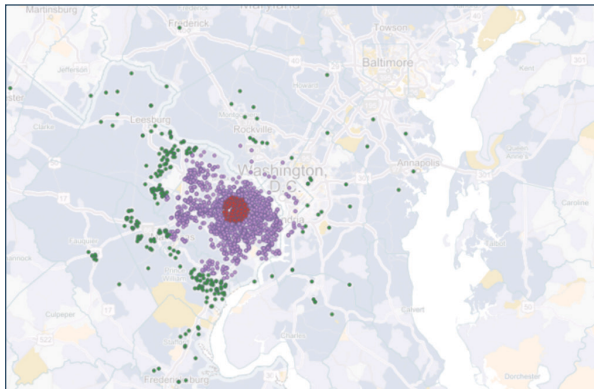


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The benefits for ITMI

ITMI brought the Tableau solution onboard for about one-third of the cost of a comparable on-premises solution. It is fast, secure, and helps ITMI to comply with stringent regulatory requirements. Additionally, the Tableau and AWS solution provides:

- A way to integrate with existing data management systems to rapidly analyze large genomic data sets.
- The ability to articulate global origin implications of genomic variation.
- Empowerment for researchers, analysts, and clinicians to ask and answer intuitive questions of the data, without extensive training costs.

ABOUT TABLEAU

Tableau is an enterprise analytics platform that enables your organization to explore trusted data in a secure and scalable environment. It gives people access to intuitive visual analytics and interactive dashboards and allows them to create timely ad-hoc analyses that reveal hidden opportunities and “eureka” moments alike. Get the security, governance, and management you require to confidently integrate Tableau into your business—on-premises or on the cloud—and deliver the power of true self-service analytics at scale. Learn more about [Tableau for Healthcare](#) and [Tableau for Life Sciences](#).