

The Best Way to Maximize Healthcare Analytics ROI

By Bobbi Brown and Leslie Falk

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Organizations that want to drive healthcare transformation need to develop and execute a comprehensive outcomes improvement initiative, which includes an analytics strategy. [Healthcare analytics](#) has the potential to deliver significant return on investment (ROI) and is necessary for effective [population health](#) initiatives. Yet it can often be performed in the isolated realm of a single care process such as reduced C-Section rates, and reduced length of stay (LOS) or complication rates for a specific surgical procedure. Given the significant investment of dollars, people, and time, optimizing healthcare analytics ROI should include analytics efficiencies, operations/finance, and organization-wide clinical improvements, such as reductions in potentially preventable readmission rates and system-wide LOS.

As a simple analogy, consider an investment in a state-of-the-art smartphone loaded with all the bells, whistles, and apps, yet using it only to make calls. That's getting about five percent of the value out of a device that's capable of so much more. The technology is already in hand, it's just not being leveraged. To take the analogy further, healthcare organizations may accumulate disparate technologies in a patchwork analytics strategy for improving different domains. This is like toting around a television, radio, video recorder, camera...the list can go on, when really all that's needed is the smartphone.

This narrowly focused use of analytics can happen from a lack of understanding the value of analytics and a governance structure that results in work silos, a structure that needs to be reengineered in the interest of sharing insights, creating a data-driven culture, and achieving efficient outcomes improvement.

Competencies for Optimizing Healthcare Analytics ROI

The first step in the evolution of outcomes improvement is usually taken in a single clinical care process, such as asthma or diabetes care. It may be easy to demonstrate success in

one care process in one location within the organization, but it becomes more difficult to drive and sustain outcomes improvement across multiple care process families and multiple locations. This is what we would call an organization-wide or holistic outcomes improvement approach.

We referenced this topic in an article titled “Using Business Intelligence to Bring Financial Challenges into Focus” for the August 2016 issue of [HFM Magazine](#): “A successful [business intelligence](#) effort spans the entire organization. In a fully realized data-driven culture, a single data-comprehensive resource is used at many different levels in the organization, and the data are considered to be collectively an asset required to do business. When business intelligence is applied effectively, the C-suite consistently uses the data and can articulate how the data support the overall company strategy, thereby infusing the entire organization with a commitment to use data to drive improvement.”

Organizations need [data governance](#), data and analytics literacy, standard data definitions, and data from multiple sources to complete their analytics strategy.

Data quality and governance: The roles involved in establishing or strengthening data quality and governance include those who own, validate, and educate about the data, to prevent misuse of fields, recognize red flags, and ensure consistent, organization-wide metrics definitions.

Data and analytics literacy: Data experts—analysts, architects, scientists—see correlations in the data and in the “white space” around the data. They understand how to analyze, interpret, and communicate the information. But many times, the individuals requesting and reading the reports don’t understand the data in front of them. They can end up misinterpreting or misusing the data. This is a trouble spot for scaling analytics through the organization.

Standard data definitions: Another trouble spot is the varying definitions of data used in analytics. For example, there are different ways to define physician role (attending, PCP, consulting, specialist, surgeon). Different groups define LOS different ways and it results in reports that have different numbers. Which one is right?

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Open access to high-quality data from dozens of source systems: Integrated clinical—including patient reported—operational, and financial data is required for organization-wide improvement. In the context of the Triple Aim, the impact on cost, patient experience, and health outcomes cannot be determined without it.

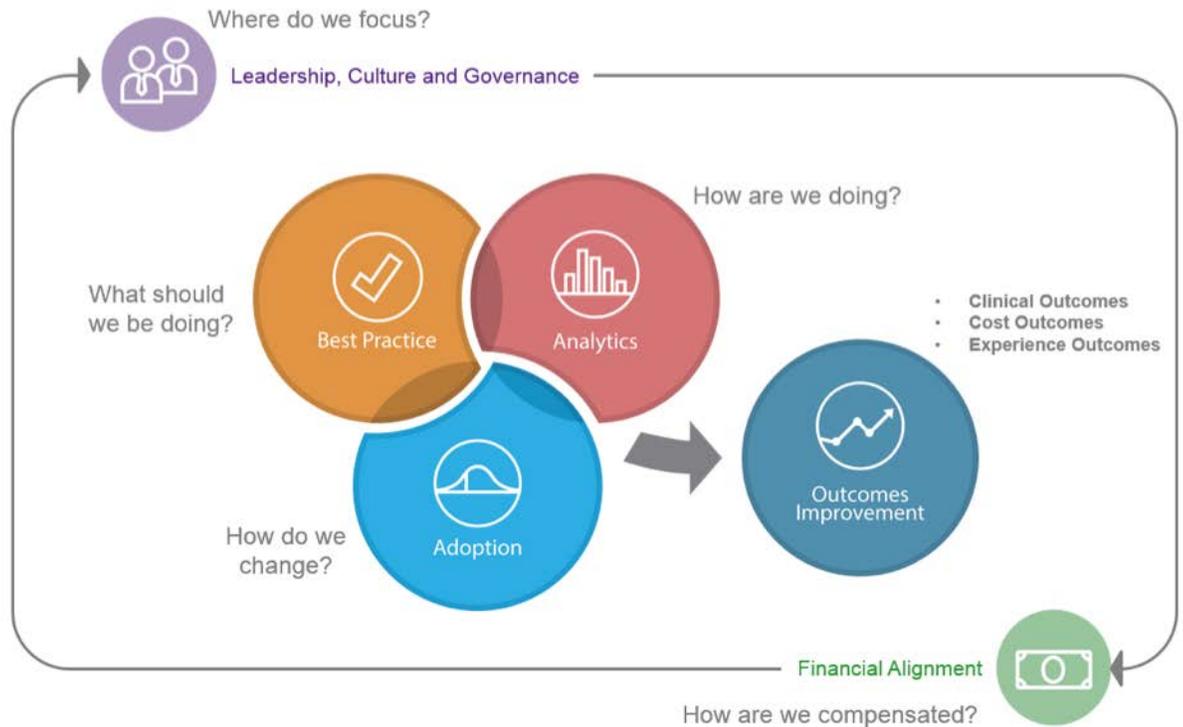


Figure 1: Keys to scaling and sustaining organization-wide outcomes improvements.

Organizations need a comprehensive strategy to drive and maximize sustained outcomes improvement clinically, financially, and operationally. The strategy needs to encompass leadership, culture, and governance, analytics, best practice, adoption, and financial alignment (see Figure 1).

Maximizing Organization-Wide Outcomes Improvements

Improvement journeys always start somewhere. Healthcare systems often start on the clinical side. Astute operational and financial leaders quickly realize the value of the data warehouse for unlocking and accessing data. This is the history of Texas Children’s Hospital, a not-for-profit organization consistently ranked among the top children’s hospitals in the nation. It adopted outcomes improvement in four domains across its system:

In addition to technology, the hospital needed to change its culture, leadership, and governance. It established permanent teams embedded in focused clinical areas, tasked with building evidence-based practices into the workflow and improving care.

1. Single Clinical Care Processes
2. Analytics Efficiencies
3. Operations/Finance
4. Organization-Wide Clinical Improvements

Texas Children's accumulated \$74 million in savings in these four categories. Let's explore some case stories that demonstrate the work and achievements in each outcome improvement area.

Texas Children's realized its EHR could not deliver a much-needed organization-wide, consistent view of data from multiple sources. This prevented clinical and administrative leadership from making data-driven, sustainable outcomes improvements. The groundwork for transforming the analytics environment, clinical processes, and value-based care was laid with an enterprise data warehouse (EDW) from Health Catalyst. This was accompanied by analytics applications, including [Key Process Analysis](#) (KPA), which identifies cost-driving clinical areas and variation in care processes.

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1. Single, Clinical Care Processes

Like many healthcare organization, Texas Children's began their outcomes improvement journey by starting with individual care processes like asthma care and appendectomies.

Asthma Care

The KPA application prioritized improvement opportunities that would have the greatest impact on patient care, while reducing variation and costs. Texas Children's turned its focus to the population of 80,000 asthma patients in Houston who accounted for 3,000 ED visits and 800 hospital admissions annually.

The outcomes have impacted policies, protocols, workflows, and patients substantially. Among them:

- ▶ Permanent, integrated teams that are sustaining care improvement

- 67 percent increase in adoption of evidence-based order sets
- Almost 50 percent decrease in unnecessary chest X-ray orders
- LOS for asthma inpatients decreased by 11 hours

Implementation of the EDW took just three months. The overall time-to-value for achieving these improvements was between six and 12 months, in order to establish reliable data trends and adoption.

Appendectomies

In another single care process case study example, Texas Children's shone its outcomes improvement spotlight on the 1,000 appendectomy procedures it conducts in an average year. Here, the hospital's Evidence Based Outcomes Center (EBOC) produced and rolled out practice guidelines to all clinicians, but there wasn't a system in place to monitor adherence to the guidelines or monitor outcomes. As with the asthma improvement work, data was lacking to drive clinical decisions.

Texas Children's turned to the [Three Systems Approach](#):

1. Best Practice: Using data to develop best practices and combining it with evidence-based medicine to design the best way for delivering care.
2. Analytics: Improving how to measure and analyze the care being delivered.
3. Adoption: Implementing transformation throughout the organization with permanent teams as guardians of improvement.

This improvement work incorporated the Health Catalyst EDW platform, an appendectomy analytics application, permanent workgroup teams, and evidence-based best practices.

Texas Children's realized significant results very quickly. Outcomes improvements included:

- Reduced LOS for simple appendectomies by 36 percent
- Reduced average variable direct costs by 19 percent
- Decreased the time between diagnosis and surgery by 19 percent

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Texas Children’s also increased the adoption rates of simple (36 percent) and complex (nine percent) postoperative order sets. Combining a single source of truth with clinical engagement enabled the team to drive a culture change of continuous, data-driven improvement.

2. Analytics Efficiencies

As the demand for analytics grow across an organization, IT and business intelligence teams recognize the need to drive analytics efficiencies, enabling data architects and analysts to move from being just report writers and data aggregators to members of the improvement work teams who can provide valuable insights. Analytics efficiency includes reducing manual data collection, provisioning, reporting, and distribution, typically represented as soft or indirect labor cost savings. It can also reduce outside reporting and analytics services, hard savings, and it may help consolidate infrastructure and result in retiring, or refraining from buying, one-off point solutions, both hard and soft savings. One-off, point solutions do not leverage the investment made in an enterprise data warehouse and, once again, may result in multiple sources and truths of data.

This Texas Children’s success story centers on the implementation of an EDW and analytics applications from Health Catalyst. IT and clinicians realized early on that the EHR wasn’t going to be the silver bullet to drive sustained outcomes improvements. They got the EHR data streaming into the warehouse in just three months. Clinicians were using information from the EDW for clinical improvement within another three months. On average, analysts took 30 hours to build each report out of the EDW versus the 97 hours it used to take from the EHR, saving 67 hours per report. Considering the hospital generated 1,300 reports annually at an average cost of \$4,832 per report, the cost and time savings were significant.

The time from EHR report request to report delivery, which previously exceeded 120 days, dropped to less than 90 days—a 25 percent improvement. Also, report requests decreased because clinicians could now see near real-time visualizations produced with data from the EDW and multiple source marts. These visualizations, estimated to contain 10 times the value of those coming out of the EHR, enabled much more powerful analytics.

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Many organizations don't recognize all the analytics efficiencies they can gain. The efficiency gains Texas Children's realized allowed them to free up IT resources on improvement initiatives.

Department analysts can now function in their intended role of providing insights based on uncovering patterns in the data versus generating reports.

3. Operational/Financial Improvements

Operational and financial improvement initiatives also benefit greatly from analytics. Improvement in these domains contribute significant ROI to the organization, generally delivering hard savings. Examples of operational and financial improvement initiatives include increased [provider productivity](#); improved [practice management](#), [labor management](#), and [revenue cycle management](#); reduced [referral leakage](#); and supplies standardization.

Although it varies as a percentage from one healthcare system to the next, labor is the largest expense category for healthcare organizations, accounting for [50-60 percent of healthcare operating costs](#). Texas Children's set out to develop a methodology to help them allocate labor resources appropriate to the demand for services.

It's process for analyzing labor productivity was, by itself, labor intensive. Texas Children's was incurring third-party support and hosting costs and the forthcoming data was still slow to arrive. Texas Children's once again turned to its EDW, coupled with the Health Catalyst Labor Productivity application to analyze volume-to-staffing ratios and review productivity in its various cost centers. In its first year of implementation, the hospital estimated that it reduced labor expenses by two percent and was making faster decisions. It eliminated the capital expense of the third-party hosted solution and, by integrating data automatically, realized \$425,000 in savings over four years.

4. Organization-wide Clinical Care Processes

Organization-wide clinical outcomes improvement initiatives at Texas Children's focused on LOS and readmissions. Again, these required leadership, culture, and governance, analytics, best practice, adoption, and financial alignment. These types of organization-wide outcomes improvements generally take longer, with an estimated time-to-value of 18-24 months.

“To improve financial performance, Texas Children’s launched an organization-wide performance improvement project called “Delivering on the Vision” (DOTV).”

Texas Children’s was in the midst of a \$1.5 billion expansion of its clinical care, academics, and research capabilities. At the same time, it faced federal and state funding reductions, increasing competition, and the prospect of a \$50 million shortage in capital reserves needed to maintain its bond rating. To improve financial performance, Texas Children’s launched an organization-wide performance improvement project called “[Delivering on the Vision](#)” (DOTV). It needed to improve the quality of patient care, increase revenues, and reduce costs.

To accomplish this required sustained, transparent, easily visualized data and measurement, something the EDW already provided them through integrated data from the EHR, finance, operations, and other systems. They already had an organization-wide, single source of truth they could use to inform clinical and operational decisions.

The DOTV initiative generated \$74 million in operational improvements over the course of 18 months. Texas Children’s realized a 14 percent decrease in hospital LOS while the census increased. Additionally, they realized these operational improvements:

Practice Management

- Increased capacity, physician throughput, and schedule template utilization by 29 percent
- Decreased no-show rates by 36 percent
- Increased internal referral rates by 16 percent

Provider Productivity

- Increased provider productivity by 15 percent
- Increased revenue per clinical FTE by 39 percent

The clinical improvements outlined earlier in single care processes, analytics efficiencies, and operations/financial efficiencies also contributed to the \$74 million in improvements. The DOTV initiative infused leaders, frontline managers, physicians, medical staff, and the administrative team with the continuous process improvement mindset that can only truly be realized with the five keys for outcomes improvement shown in Figure 1.

Outcomes Improvement Takes an All-In Approach

It's no secret that analytics can be used to improve single clinical care processes. But, analytics can also be used to drive and sustain analytics efficiencies, operational and financial and improvements, and organization-wide clinical improvement initiatives such as reduced LOS and readmissions. Healthcare systems would be wise to maximize their analytics investment in all four areas: single clinical care processes, driving analytics efficiencies, operational and financial improvements, and organization-wide clinical processes. Texas Children's Hospital was able to place a \$74 million capstone on top of the strategy that brought all of these things together, realizing the ROI of its EDW and analytics. It's been an investment that continues to grow organization-wide ROI as people throughout the organization realize greater value from the data and analytics already at their disposal.

About the Authors



Bobbi Brown is the Vice President of Financial Engagement for Health Catalyst. Ms. Brown started her healthcare career at Intermountain Healthcare supporting clinical integration efforts before moving to Sutter Health and, later, Kaiser Permanente, where she served as Vice President of Financial Planning and Performance. Ms. Brown holds an MBA from the Thunderbird School of Global Management as well as a BA in Spanish and Education from Misericordia University. She regularly writes and teaches on finance-related healthcare topics.



Leslie Hough Falk is the Vice President of Customer Engagement at Health Catalyst. She has worked as an Executive Engagement Manager and in various marketing roles. Leslie is a Registered Nurse. Prior to Health Catalyst, Leslie worked for Hewlett-Packard in sales, support, and marketing roles. She also worked for Kaiser Permanente as their first Biomedical Engineer in the Northern Region and helped launch the first Pediatric ICU in the state of Nevada. Leslie holds a Masters in Business Administration, Masters in Community Counseling, and a Bachelor of Science Degree in Engineering. Leslie has also earned certifications as a Project Management Professional (PMP), Green Belt Lean, and Information Privacy Professional (CIPP, CIPP/IT).