

This main group structure represents the hub. Clinical, financial, and operational teams (as well as ad hoc reporting teams) represent the spokes. The hub-and-spoke framework allows centralization and deduplication of services in the hub. The teams in the spokes have access and control, which allows them to accomplish their work. The spokes interact with, and depend on, the hub, and data governance policies guide decisions throughout this structure creating a collaborative feedback loop.

Building the IT framework starts with executive leadership taking responsibility for data governance over the entire framework, both hub and spoke. Next, the executive leadership establishes an analytics governing body—an enterprise-wide analytics and business intelligence group that oversees four recommended groups of the IT framework:

1. Technology and data provisioning services (e.g., the [Health Catalyst® Data Operating System™](#)).
2. Legacy application development and operations.
3. Enterprise reporting services.
4. Enterprise analytics engineering.

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A typical analytics transformation has a short time to value. The sample timeline in Figure 3 shows how healthcare organizations can go from base camp (phase one: setting the cultural tone of being data driven) to the summit (phase five: utilizing data) in less than 12 months. The size of the organization and its readiness for change may impact the timelines.

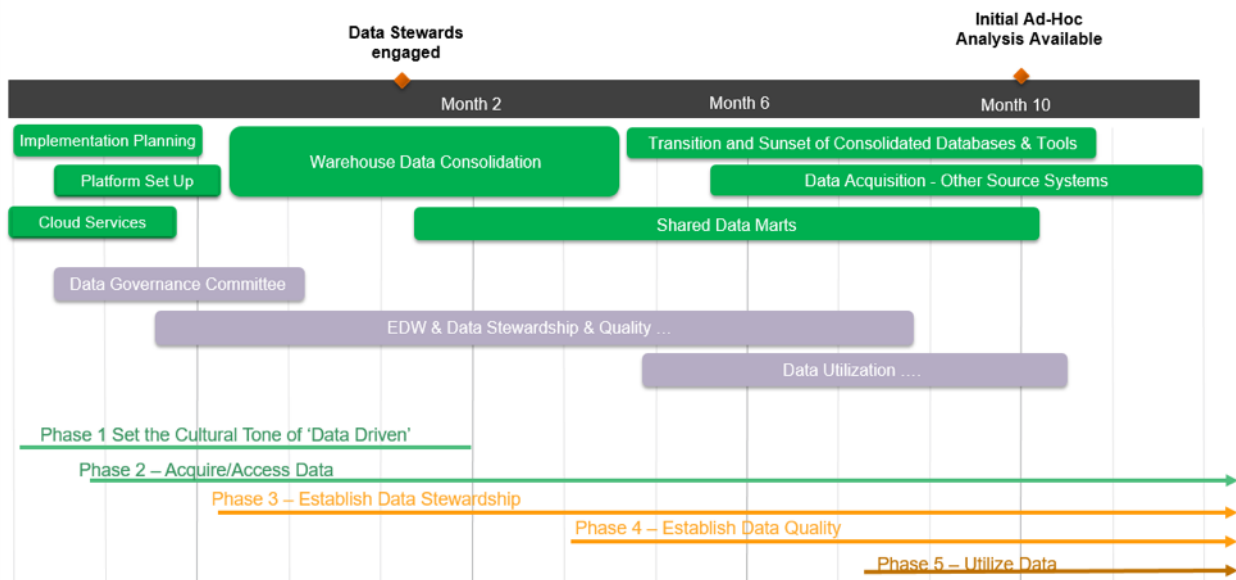


Figure 3: Sample timeline for transforming the IT and analytics framework

As the timeline shows, several technology projects can launch concurrently, some even as the organization is still establishing a data-driven culture. It's important to note that, during year one, while the organization is focused on analytics infrastructure and improvements, it will accomplish other important goals, such as improving report writing and surfacing [dashboards](#); it may not, however, realize

substantial measurable improvements (e.g., reducing variation, creating efficiencies, and improving finances) until a year two or later.

Partnerships Ensure the Analytics Transformation Stays on Course

Once health systems have worked through the five phases of becoming data driven and built an appropriate IT framework, they need experienced partners with the proven ability to meet the challenges of analytics transformation. The outcomes listed below demonstrate the types of improvement possibilities and ROI that can result from these effective partnerships:

#1: Operational Efficiencies

Texas Children's Hospital [significantly reduced reporting costs](#) using a healthcare EDW:

- 67 percent savings in labor costs.
- 69 percent decrease in time to build reports.
- 25 percent faster turnaround on remaining EMR reports; the turnaround time for people looking for a report can be anywhere from two weeks to four to 12 months.

Partners Healthcare deepened its understanding to the market trends and business drivers of a [complex healthcare organization](#):

- Increased operational efficiency by up to 75 percent.
- Strategic questions answered up to 10 times faster.
- Fivefold increase in the number of users adopting the analytics platform.
- Drove cultural transformation from data to strategy.

#2: Financial Results

Memorial Hospital avoided PQRS penalties and earned potential incentives with accurate [submission of quality measures](#):

- Avoided four percent Medicare penalty.
- Eliminated time-intensive manual data collection.
- Enabled identification of data quality issues.

Service lines and activity-based costing revealed [true cost of care](#) for University of Pittsburgh Medical Center: Reduced cost by \$42 million.

- Realized \$5 million in supplies savings.
- Improved time to access information by up to 97 percent.

#3: Reduction or Repurposing

Faster data acquisition delivered speedy [time to value](#) at Orlando Health:

- Integrated encounter billing summary system data in 245 fewer days and 1.0 less FTE.

- Integrated infection control system data in 56 fewer days and 0.4 less FTE.
- Implemented enhancements to the system (e.g., adding columns and changing data source pulls for reports) in 56 fewer days and 0.4 less FTE.

Machine learning, predictive analytics, and process redesign [reduced readmission rates](#) by 50 percent at the University of Kansas Health System:

- Achieved relative reduction in all-cause 30-day readmissions by 39 percent.
- Achieved relative reduction in 30-day readmission of patients with a principle diagnosis of heart failure by 52 percent.
- Achieved additional readmission rate reductions for patients enrolled in the hospital-to-home program:
 - 42 percent relative reduction in all-cause 30-day readmissions.
 - 49 percent relative reduction in 30-day readmission of patients with a principle diagnosis of heart failure.

#4: New Opportunities for Outcomes Improvements

Texas Children’s Hospital delivered systemwide [performance improvement](#):

- Achieved \$74 million in operational savings.
- Reduced LOS by 14 percent, while hospital census had increased, to provide greater patient access.
- Achieved a data-driven, transparent culture with accountable clinical and operational leadership.

Mission Health used [value](#) to prioritize and guide analytics investments:

- 80 percent of 55 approved projects met or exceeded initial targets.
- Sample realized project outcomes included:
 - 32 percent reduction in sepsis mortality.
 - 20 percent improvement in sepsis bundle compliance rate.
 - 7 percent reduction in LOS for bowel surgery patients.

In each of these success stories, health systems carefully selected their summits, dedicated themselves to their training and preparation, and chose the right partners, or guides, to help them safely and successfully reach their goals.

IT and Analytics Improvement Initiatives Unlock Substantial ROI Potential

Just as a mountaineering expedition begins at base camp and requires certain preparation, processes, equipment, and guidance to reach the summit, health systems can scale the tallest peaks of healthcare improvement and cost savings by following a plan (the five phases of IT and analytics transformation), including identifying an opportunity, choosing the right IT infrastructure, and forming partnerships that support the journey.

Transforming IT and analytics has a profound impact on an organization's people, finances, and overall outcomes, which can optimize the business of healthcare to meet the challenges of value-based care.

About the Authors

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Dan Hopkins joined Health Catalyst in June of 2012; most recently, he worked for Frederick Memorial Hospital as a Senior Data Solutions Architect creating dashboards related to nursing sensitive indicators and patient satisfaction. His other career highlights include roles at the University of Utah as Senior Data Architect, Senior Data Analyst and Senior Business Analyst, Iomega as a Senior Oracle Applications Analyst, Hunt Oil in Dallas, Texas as an IS Project Manager and Senior HRIS Analyst and Mirage Resorts in Las Vegas as Compensation/HRIS Manager, Senior Financial Analyst and Assistant Executive Hotel Manager.