ThedaCare's Clinical & Business Intelligence Journey

Introduction

The use of data to harvest clinical and business intelligence is a complex discussion that can meander through several topic areas including the processes by which organizations collect and report on data and the types of conclusions to which those reports can come—mainly financial or clinical conclusions. In determining the level of an organization's maturity regarding these activities, one needs to consider the purpose of its intended activities.

This case study examines ThedaCare's journey along a business intelligence maturity curve and highlights several observations and lessons that can help others who might want to setup a similar function at their institution.

ThedaCare Historical Context

Like most health care networks, ThedaCare found itself facing growing data challenges over the past decade. The volume of requests for data reporting was growing at a pace the organization could not meet. Business partners would end up frustrated with wait times, data warehouse system performance and staff availability. In addition, the organizational structure's complexity and processes hampered the ability to meet quality improvement endeavors.

Twelve years ago, during the organization's implementation of its LEAN initiative[1] (see sidebar), a business intelligence team was created to better provide data and analysis solutions leveragable across the entire organization. The purpose of this team was twofold: enable clinical and business decision making and improve the efficiency of the overall data delivery system. Business intelligence would be made available to drive business transformation through a collaborative, networked process focusing on constantly supporting and optimizing performance.

About ThedaCare

ThedaCare is a Wisconsin-based community health system consisting of five hospitals, ThedaCare Physicians, ThedaCare Behavioral Health, ThedaCare At Work & ThedaCare At Home. There are over 20 clinic sites.

ThedaCare At-A-Glance	
Physicians	600 private practice and 180 employed (120 Primary Care 60 in Orthopedics and Cardiology)
Hospitals	5 hospitals totaling ~440 beds; Over 22,000 admissions in 2011
Senior Care	58 bed skilled nursing facility and Assisted Care
Behavioral Health	~59,000 office visits yearly
Home Care	Over 92,000 visits in 2011
Ambulatory Sites	27 sites with ~575,000 office visits in 2011
IT platform	Epic client for over 12 years. Hosts Epic for 30 private clinics and Bellin Health in Green Bay
Employees	6,175 – largest employer in Northeast Wisconsin

ThedaCare has been a leader in implementing healthcare value and reforms. As part of the Healthcare Quality Coalition (www.qualitycoalition.net), ThedaCare is part of a group of 25 leading health systems, hospital associations and medical societies from 15 states advocating for healthcare delivery system reform that prioritizes value through high quality, low cost care. As part of the Wisconsin Collaborative for Healthcare Quality (www.wchq.org), ThedaCare's ambulatory quality measures ranked #1 in 2012. ThedaCare established the ThedaCare Center for Healthcare Value (www.createvalue.org) whose mission includes collaborating with patients and leaders in the provider, employer, insurer, and government communities to create transparency of healthcare performance; care delivery with less waste and fewer errors; and payment systems that reward patient value creation.

Through the years, the continuous process improvements have led to some impressive results:

- From 2008 to 2012, reduced year over year business intelligence software maintenance by $130K (>60% savings) while doubling overall user volume
- Improved service level demands with 7:00 AM new data delivery
- Savings of $800K in overtime in 2011, additional reduction of 3.5% in 2012
- Essentially eliminated the annual budget cycle process by moving to a rolling forecast, reducing labor by about 20,000 hrs/year at an estimated savings of $1 million [4, 5, 6]
- Collaborative problem solving: over 6 analysts free to focus on analytics
- Support for workbench reporting to provide end users with real-time data
- Consistent measurement and meeting of demand

What is LEAN? [2, 9, 11, 12]

Born out of the manufacturing environment and often combined with the implementation of Six Sigma process improvement, LEAN is most commonly understood as a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Working from the perspective of the customer who consumes a product or service, value is defined as any action or process for which a customer would be willing to pay.

However, if one pays attention to LEAN's historical origin, Toyota Production System (TPS)—now named Toyota Way—one finds that there are two simple tenets to LEAN:

1. Continuous Improvement
2. Respect for People

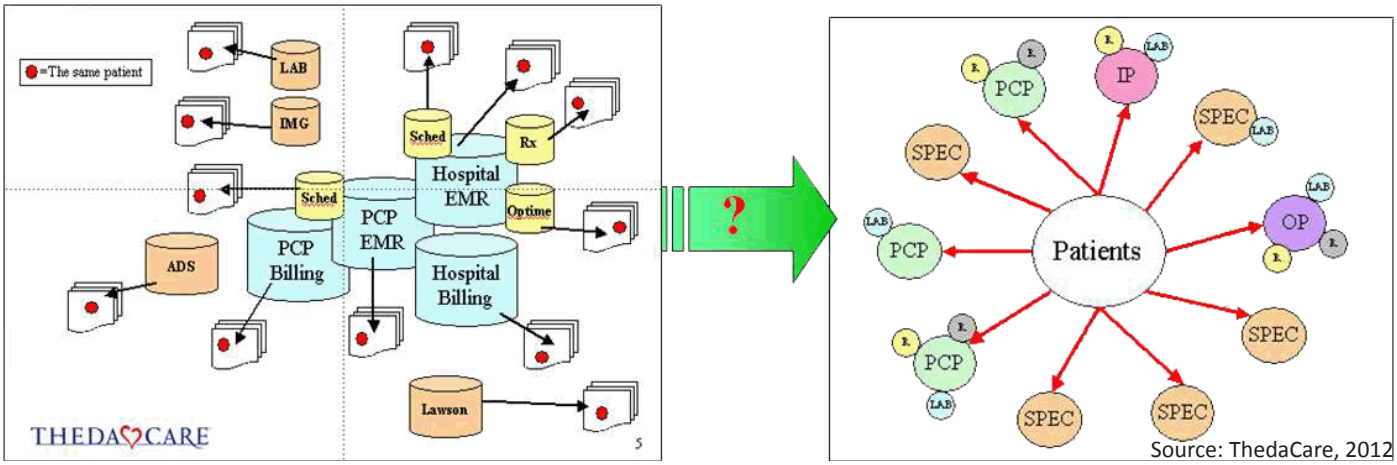
For the purpose of this case study, we refer to the process improvements as they relate to the Decision Resources Department's fulfillment of their reporting and analysis requests.

The Decisions Resources Department in Detail [3]

This business intelligence team, named the Decision Resources Department (DRD), was set up under the Chief Medical Officer (CMO) to work in concert with the IT department to recognize and take advantage of its strategic asset—the data from its various network entities.

One key function of the DRD was to provide solid clinical intelligence from the analysis of patient data and the overall population. With logic to map patients across the different data sources, all data was pulled by patient to show hospital costs, social work, physician visits, lab results to name a few areas of interest. The cataloging of that data enabled the analysis by service line, chronic condition, etc.

While the CMO championed the initiative, relationships with the entire "C-Suite" were critical to success. An integral cultural approach was to maintain data (asset) transparency. At ThedaCare, the focus was on the work



Source: ThedaCare, 2012

and getting it done. The priority was to develop the DRD and to secure dedicated resources that would not be reappropriated.

Over time, the CMO went on to become the CEO and at that point the DRD moved under the IT department. In order to more quickly and efficiently serve those departments with an increasing amount of reporting and analysis requests, the department assumed responsibility for related staff resources. This included a database administrator, a home care analyst and two financial analysts. To ensure a consistent focus on quality, the Quality Department works in concert with the DRD in the direction of several of its resources.

The DRD supports clinical and business intelligence needs for nearly all of the organization:

- Clinical Quality: practice management, EMR reporting for independent physicians
- External and Internal Reporting
- The Accountable Care Organization
- Population Management
- Home Care
- Operations Performance
- Financial Analysis
- Various divisions of service for the hospital inclusive of hospital administrative services

Current staffing for ThedaCare's Decisions Resources Department are as follows:

- 14 Business Analysts, includes the support to all of the divisions as well as the private practices on Epic
- 4 Data Analysts – extract, transform, load (ETL) process and support business analysts
- 2 Data Architects – governance, structure, etc. One primarily hospital-oriented and 1 primarily physician clinic-oriented
- 2 Database Administrators
- 1 Finance Analyst
- 1 Administrative Assistant
- 2 Project Leads
- 1 Systems Engineer
- 1 Director

It is important to note that this department was built over twelve years, its size increasing over time as it progressed up the business intelligence maturity curve.

A Business Intelligence Maturity Model [8, 10]

The Gartner Business Intelligence (BI) Maturity Model explains five levels of an organization's maturity in the creation and use of business intelligence.

Level 1 Organizations can be characterized as working with data in a piecemeal way getting ad hoc reports that may or may not be shared with the right audience. There is no timely delivery of information and if it were delivered to a larger audience there's no guarantee that it would be the right information.

Level 2 Organizations have departments who have started to uncover the potential of business intelligence but there is no central sponsor. Often starting in the finance department, these organizations will experience the beginning of improvements due to finance's typical detailed approach to cost control and budget adherence. These organizations, once tools and reports are setup, tend to get complacent and fail to improve upon their tools to get greater value from their initial investment.

Staff Development

The Director of the DRD prioritizes and strongly focuses on the development of staff. This includes a semi-annual evaluation of skill sets and the creation of individualized development plans for each team member, ensuring productivity is aligned with development time. Further, analysts are incented to spend 10% of their time on their individual development plan (learning new skills) and another 10% improving prior work—in LEAN terms, focusing on continuous improvement. The overall guiding principle is that the time spent on development makes for a more productive and efficient staff in the long run.

The skills evaluated include:

- Technical Skills (such as SSIS, Qlikview, Query Analyzer, Excel, etc.)
- Business Skills (process knowledge such as knowledge of claims, billing, coding, etc.)
- Analyst skills (statistics, SPC charts, data quality, process improvement, etc.)

In this structure, levels are set for core and advanced skills. Every team member is aware of his or her score on each skill. Team members will develop goals relative to the skill on which improvement is needed. The team members then pair up with more advanced staff members for mentoring where possible. The ThedaCare management team has found that this method has also enriched the work of the advanced workers.

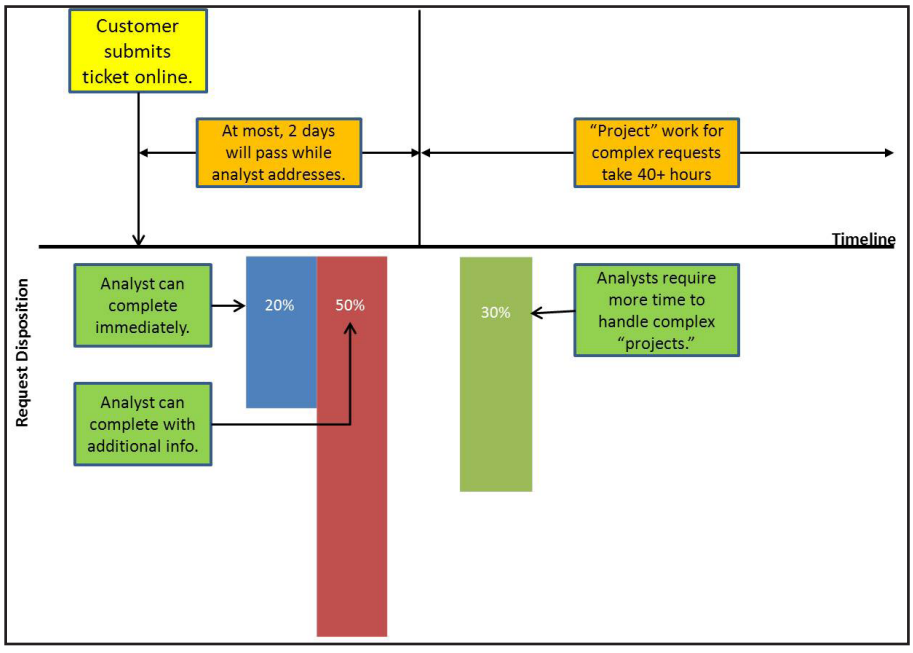
The entire team is routinely evaluated by management to ensure a balance between technical, business and analytical skills.

Management believes that because of these practices, the department maintains its very low turnover and the one of the highest employee engagement scores in the company.

Workflow Process

One of the first things the department established was an intake process. This was important to align strategies of the organization and begin the engagement and internal customer adoption in the new process along with a renewed efficiency in the request process.

Ad hoc requests are submitted via online form, creating a ticket with an explanation of the customer's requirements. This request enters the work queue where an analyst will address it within two days. At ThedaCare, approximately 20% of requests can be immediately completed, another 50% requires more detail prior to completion, and the remaining 30% are more complex, require further definition and become projects.



Projects are defined as those requests that take greater than 40 hours and/or involve multiple departments to complete. These projects often require additional authorization. The analyst will estimate the time needed and inform the end-user. All projects

require a charter, scope and project plan.

As the efficiency of the group has increased, average turnaround times have decreased from 12 to 3 hours. Providing a set of standardized reports in a self-service repository has resulted in roughly 30 fewer requests per month, making the monthly average 120 requests.

Prioritization of work requests is measured constantly. If necessary, an analyst can escalate requests to project leads and the director if unable to determine the urgency or if further authority is needed to prioritize requests. ThedaCare has established a culture of transparency for all requests. Through proprietary software, all end-users are able to view the DRD request queue enabling everyone to see request details and volume of requests in the queue.

Data Validation and Ownership

At ThedaCare, the DRD has an end-user data validation policy. Analysts perform a cursory review of the data in a resulting report with the customer. If the data is perceived to be skewed by the customer or an issue is found on data intake (i.e.: data entry error) it is the customer's responsibility to create the fix in the source system. The DRD does not fix health records.

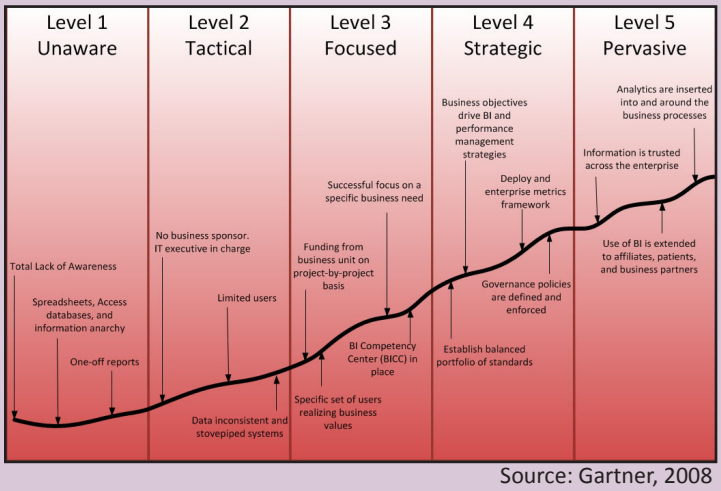
Customers routinely perform audits and are responsible for how their data is used. This is a critical step for organizations that would achieve greater maturity along the business intelligence curve.

If a known data problem is identified and/or the data is not valid for certain departments, for example, the analyst will place a disclaimer on the report warning that the data may be incomplete or inaccurate.

The Business Intelligence Maturity Model (continued)

Level 3 Organizations have realized the value and use of tools has spread beyond finance. More complex forms of analysis become possible given the various sources of data. These organizations have considered the creation of a BI Competency Center led by the IT organization.

Level 4 Organizations have taken reporting to the level of self-service and get their data from many, if not all, departments within the organization. The value of business intelligence is understood at the enterprise level and a significant number of leaders have made the use of that intelligence mandatory for running their departments.



Source: Gartner, 2008

Level 5 Organizations have taken the value and benefits to a level such that the use of business intelligence has been ingrained in the culture of the organization. These organizations share data with external partners and make use of their data as well to further influence the strategic shaping of the organization and improve outcomes.

Report Distribution Tool

ThedaCare is currently using Qlikview® to distribute reports and analytical information. This is a central repository where the DRD publishes reports and end-users login to get their data. In addition, dashboards were developed for end users where they are able to filter data on a variety of levels from the organization, down to service line and ultimately by patient.

The DRD is also responsible for the end-user training of Qlikview. The level of access for the end user is determined by job need. The end-users are trained for 1-1.5 hours whereby they are taught how to navigate the tool itself along with evaluating data within the tool. To date, 1500-1800 end users have been trained. The system averages approximately 150 concurrent users.

Collaboration and Governance in Overall Business Strategy

During strategic planning, IT and the DRD are assigned responsibility by ThedaCare's board and executive team for all clinical and business intelligence needs as part of the planning process. The Decision Resources management team plans for these projects assigning appropriate resources with a "load balanced" approach on a 12- to 18-month timeline. ThedaCare makes an effort while planning to prioritize work with its resources in mind ensuring a cost-effective delivery.

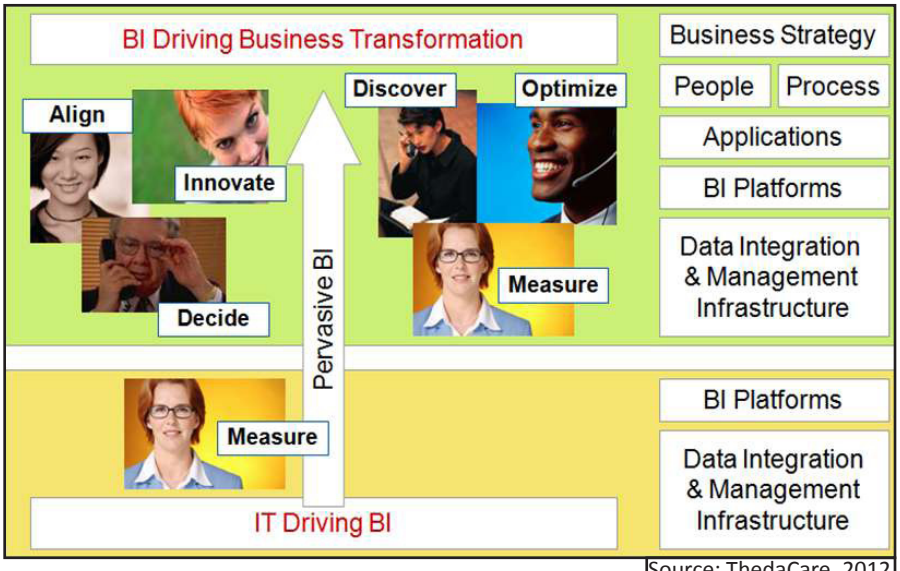
Currently, ThedaCare is moving toward a technical governance committee approach to IT strategy and project prioritization. The IT Governance Committee is in the early stages of development and is focused on project prioritization and feasibility assessment. This Committee includes senior members of the IT team, senior and middle management of the business areas, the project management office and a LEAN facilitator.

ThedaCare's Business Intelligence Competency Centers (BICCs) [7]

ThedaCare has wide adoption of Clinical & Business Intelligence (CBI) by all levels of the organization. This approach has resulted in business owners having a greater role and control in the discovery and transformation process.

A Business Intelligence Competency Center (BICC) is a cross-functional organizational team that has defined tasks, roles, responsibilities and processes for supporting and promoting the effective use of CBI across an organization. ThedaCare organized targeted work groups for the specific service lines below and included subject matter experts as members representing all aspects of the service line (nursing, supply, billing, coding, finance, quality, etc.):

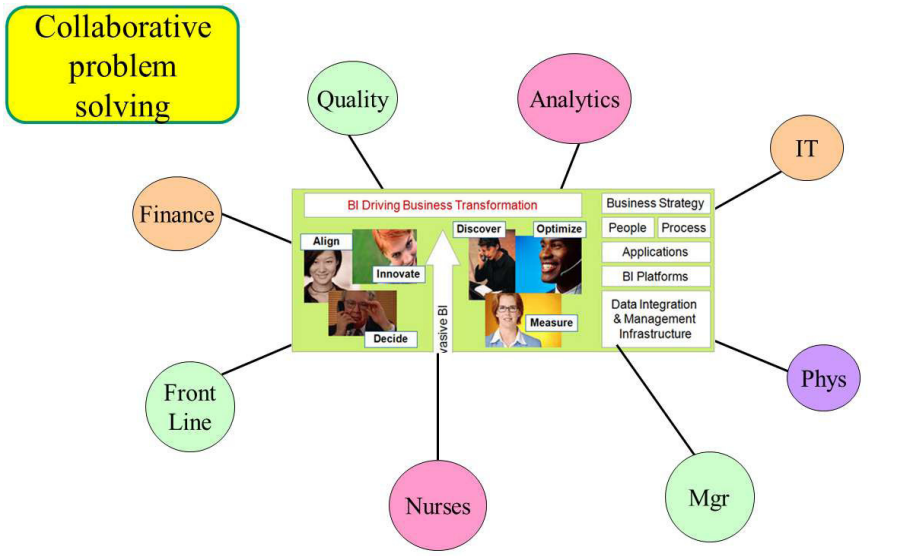
- Oncology
- Cardiology
- Spine
- Orthopedics



Source: ThedaCare, 2012

The groups studied the value stream for each of these services. Patients for these services were tagged so data could be pulled for the specific populations being studied. The group meets weekly for an entire day to work through all issues during one session.

Meetings are led by the business sponsor (usually an executive stakeholder) and the technical team helps with initial facilitation. Although the improvement process is normally business end-user led, the technical team assists other members through the "forming, storming, and norming" phases and on to the performing phase.



Source: ThedaCare, 2012

All team members are cross trained to retrieve the data they need and the data is reviewed as a team. The BICC teams have an "everyone's an analyst" approach versus being only a finance, data or IT expert. All team members are to have an equal part in analyzing the data and developing improvement plans. The goal with this approach is a quick turnaround in resolution or building solutions—sometimes on the fly as needed.

Example: Cut Cost in the Spine Value Stream

Problem: Cost per surgical case was high with certain providers.

Solution and Result: After analyzing data associated with the processes of each of the providers, they discovered that some providers used a more expensive glue for closure. The BICC team was able to pull clinical outcomes data that proved there was no difference in patient outcomes related to the different types of expensive glues used.

Using detailed surgical data comparing physicians on a like-patient basis, the value stream leader partnered with surgeons to agree to use the less expensive product. Eventually all providers switched to the more cost effective product.

This improvement of clinical and business process by utilizing C & BI tools resulted in an approximate savings to ThedaCare $650,000 per year.

Example: Eliminate the Budget Process

Problem: Annual budget process was time consuming and thereby costly on an annual basis.

Solution and Result: Key Performance Indicators (KPIs) were established by the executive team. The DRD developed dashboards and tools for real-time monitoring by the management team. The Leadership Team is provided daily, weekly and monthly data trending performance against the KPIs relative to operational costs specific to individual purview. The Leadership Team is then able to make operational improvements and adjustments in real time versus taking action retroactively.

Through this process, utilizing CBI tools across leadership within the system, ThedaCare was able to eliminate the annual budget process altogether. ThedaCare was able to save an estimated $800,000 the first year based on time and overtime spent on the budgeting process. An additional unmeasured improvement attested by ThedaCare executives is that the management team is now more cognizant of day to day variations in operations and work to address them more expeditiously and efficiently.

Summary

The establishment of the Decision Resources Department, and through it a formal Clinical and Business Intelligence program, has supported ThedaCare's achievement of its strategic objectives in safety, quality and financial performance. Organizations can learn from ThedaCare's combination of processes, staff development and organizational engagement practices in their own CBI efforts.

Going forward, ThedaCare's journey of continuous improvement may entail more advanced secondary use[10] of their data to inform and improve their clinical practices.

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Resources

- ThedaCare, www.ThedaCare.org
- ThedaCare Center for Healthcare Value, www.createvalue.org
- Healthcare Quality Coalition, www.qualitycoalition.net
- Wisconsin Collaborative for Healthcare Quality, www.wchq.org
- Qlikview, www.qlikview.com

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