17 Overview of Healthcare Analytics Best Practices Across the Ecosystem

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Analytics in healthcare is old and new. Science has been a strong underpinning of healthcare in the research devoted to the discovery of causes and treatments of disease. However, delivering this knowledge from the bench to the bedside to optimize the care of every patient has been an ongoing challenge. Although treating sickness, that is, the interaction between a patient and her caregivers, is the raison d'être of healthcare, the industry is more complex than that. The American way of healthcare requires large doses of payment, finance, regulation, research and development, and administrative and business supports. Healthcare is a huge part of the U.S. economy, accounting for 18% of GDP at a spending rate of $8,500 for every man, woman, and child.[1] **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch17#ch17end01)** And it is big business. Annual hospital expenses are approaching $1 trillion, and physician services are more than $0.5 trillion. Both of these categories of providers amount to more than 50% of spending. The next highest spending area is for prescription drugs, which amounts to 10% of spending.

Healthcare is both an informational and a personal business. It is personal because it deals with people, and communications and relationship skills are fundamental to making change happen. It is informational in that it is about discovery, measurement, improvement, and running a business.

Analytics is the high octane fuel to feed the thirsty information engines. It holds the promise to improve people's lives, increase revenues and reduce costs, and to change the very nature of what healthcare is and what it can be.

Part IV (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/part04#part04) is on best practices and includes eight case studies of leading organizations in healthcare analytics. These are bellwether organizations and represent the best of the art and science of analytics as of 2012. The case studies are inclusive of the settings where analytics is practiced including providers, payers, and a life sciences company. It includes both the public and private sectors.

The chapters in **part IV (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/part04#part04)** address the "whats" and "hows" of analytics to support organizational strategies and goals. The whats include the domains of the content of analytics, including clinical, business, and marketing purposes. The hows include the functions of analytics, including how it is organized, how it adds value, and its technical challenges.

Providers

Providers are the boots on the ground in healthcare: the doctors, nurses, and a myriad of other care professionals who interact with patients and their families to treat them. Their efforts are important to people's well-being, and very often spell the difference between life and death. This is where the rubber meets the road, where the clinical knowledge created by research, the pills and devices developed by life science companies, the financial coverage provided by insurance companies, the healthcare benefits provided by employers, and the support by all the business functions of hospitals and other healthcare settings all come into play. As such it is a vitally important fulcrum for analytics to support clinicians with information, knowledge, and the tools to improve practice.

The providers included in the case studies are very large, ranging in revenues from just under $1 billion to over $150 billion. They are integrated delivery systems that provide a continuum of care from hospital to outpatient care in an organized and coordinated way and are accountable for the populations they serve both clinically and fiscally. Because they are accountable, they are more incentivized to use analytics and make continual improvements.

The Whats

These five best practice providers in **Part IV (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/part04#part04)** , including Partners Healthcare System, Catholic Health Initiatives, Veterans Health Administration, Air Force Medical Service, and HealthEast Care Sytstem, have been at the vanguard of health analytics partly because of four common areas of content and focus:

- They were early adopters of electronic health records (EHRs). EHRs support their patient care strategies, such as care coordination, disease management, and use of care protocols, by increasing the availability of individual patient and population data and by improving communication among providers. Partners Healthcare, the VA, and the Air Force had EHRs in place systemwide by the early 1990s. Note that only 35% of U.S. hospitals had adopted EHRs by 2011.[2] **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch17#ch17end02)** Early wins from EHRs included Computerized Provider Order Entry (CPOE) systems, which improved the accuracy of physicians. medication orders, and also measuring adherence to medication guidelines. For example, adverse drug events were cut in half after the introduction of these systems at a Partners hospital.
- The leadership for clinical analytics is clear at these organizations. They want to achieve clearly articulated institutional goals such as reducing medical errors, achieving uniformly high clinical quality, improving chronic disease management, and using clinical resources efficiently. One of the keys to the transformation of the VA was a performance measurement system that was used to hold senior managers accountable for improvement in performance measures. The analytics undergirding the accountability system include tracking metrics and reporting on them through dashboards. Similarly, HealthEast set out on a "quality journey" to become the benchmark for quality in the Twin Cities area and deployed analytics for measurement and improvement strategies.
- They use a clinical data warehouse for research purposes. For example, Partners uses it for postmarket surveillance to detect problems with drugs and medical devices after they are released to the market. The VA detected an outbreak of a rare form of pneumonia and was able to determine that a certain nasal spray was the cause. The warehouse also provides the data

foundation for supporting many forms of research, which can garner big revenues for these institutions.

- Finally, these institutions use analytics for business and finance functions including optimizing revenue, understanding employer attrition, claims adjudication, and reimbursing physicians based on performance metrics such as cost-effective use of imaging services.

The Hows

Much of the work in analytics in healthcare today is building capacity specifically related to connecting the data "pipes" and integrating the data including various forms of clinical, operational, and financial data. The Partners case study demonstrates the issues involved in deciding what goes into an enterprise level analytics design versus a hospital-specific design. Similarly, the overarching question of **Chapter 19 (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch19#ch19)** , "Catholic Health Initiatives," is how does a healthcare organization translate data into actionable information for every stakeholder across the enterprise? The need for an efficient and scalable data warehouse is discussed in **Chapter 21 (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch21#ch21)** , "**The Health Service Data Warehouse Project at the Air Force Medical Service (AFMS) (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch21#ch21)** ." It addresses the challenges of finding, acquiring, improving, and integrating data and reducing long lead times and frustration on the part of users. **Chapter 22 (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch22#ch22)** , "**Developing Enterprise Analytics at HealthEast Care System (http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch22#ch22)** ," focuses on how to organize analytic teams at different levels to accomplish different purposes.

Payers

Payers, including a multitude of commercial health insurers, employers, and governments, provide the financing for the high cost of health services in the United States. Payers face epic challenges, including the advent of health information exchanges, health insurance exchanges, new Affordable Care Act (ACA) regulations on coverage, premium reviews, profit margins and mandates, new provider models such as Accountable Care Organizations (ACOs), and a huge new pool of customers who were previously uninsured. Payers also face the dual demands to 1) change their business model of providing wholesale insurance to employers to providing retail health and insurance services to individuals while also 2) focusing on the health and management of populations.

Payers had gotten into a routine of managing the economics of benefits and coverage, premium pricing, and various insurance products, but were not as actively engaged in managing health and medical care of members/employees as they were for the brief but noteworthy managed care era of the 1990s. Now, the tenor has changed and the pendulum has swung back and beyond such that insurers are changing the very nature of their business by blurring the lines between payers and providers to ensure better business results and also by changing their mission to become a health company and/or to become an information company where insurance is just one product line for these organizations.

The analytics challenges and opportunities are daunting. Payers have relied on claims data as their intelligence source to understand their business but will need to rely on diverse data to address the above challenges. This diverse data coupled with need to comply with unrelenting regulations will necessitate the review of legacy systems, the capacity of existing data warehouses, and a heightened need to integrate, process faster, discover insights, and contribute regularly to the bottom line.

There are two chapters in **Part IV** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/part04#part04)** on payers, including a health insurer—**Chapter 23** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch23#ch23)** , "**Aetna** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch23#ch23)** ," by Kyle Cheek—and an employer—**Chapter 24** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch24#ch24)** , "**Employee Health and Benefits Management at EMC: An Information Driven Model for Engaged and Accountable Care** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch24#ch24)** ," by David Dimond and Robert Morison.

Cheek notes that Aetna's analytic maturity is high (4+) on the Davenport-Harris Analytics Maturity Model relative to an industry average of stage 2. He describes the five primary services for its internal and external constituencies including 1) provider analytics to identify opportunities for outcome and cost improvements among physicians and hospitals, 2) plan-sponsor reporting for employers, 3) program evaluation of the ongoing effectiveness of care management programs, 4) custom informatics for "special projects," and 5) data warehousing.

In terms of the factors of analytics success, Cheek says that the most important are identifying the strategic drivers that offer the most demonstrable value from analytical enhancement, lodging the data warehouse with the informatics organization, and developing an internal analytics competency.

Diamond and Morison describe a different analytics focus, on the employee, and how the company promotes health for its workforce. The EMC vision is for employers to engage patients and providers, enable health awareness and literacy, influence health and lifestyle behaviors, and drive adoption of patient-centric technologies. The analytics to support the employee focus include an employee health portal, a personal health record, health risk assessments and incentives to be healthy, and the availability of related health management programs.

Life Science Companies

As Handelsman stated in **Chapter 4** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch04#ch04)** , "**Surveying the Analytical Landscape in Life Sciences Organizations** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch04#ch04)** ," the life sciences industries are engaged in discovering, developing, and commercializing new therapies. The industry challenges are no less daunting than the rest of the health ecosystem. These include blockbuster drugs going off patent, health plan pressures to lower costs and demanding justification for the value of drugs, pricing pressures from generic drugs, long lasting investor caution following the Great Recession, the high cost and failure rate of clinical trials, and cost cutting that has cut into research innovation.

Analytics have been a core skill in the research and development discovery process and in determining value through comparative effectiveness studies. But, as in other aspects of healthcare, putting the research knowledge to use in improving clinical and business outcomes has lagged. There is great promise with the analytics of personalized medicine and the use of genomic to fill in gaps in products. And there is a renewed focus on customers that goes beyond direct to consumer advertising that can build loyalty and foster brand support.

In **Chapter 25** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch25#ch25)** , "**Commercial Analytics Relationships and Culture at Merck** **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch25#ch25)** ," Davenport reports on one

specific life science industry analytical function, commercial analytics that focus on promotion and sales, at a major pharmaceutical firm, Merck. He concentrates on the "how" of making analytics work well for the business. It's all about decision support for the sales business. According to the business, the analytics function has been successful because the group members are "thought partners": they start with a full understanding of the business question and then marshal data to answer the questions, they are "field friendly" in translating findings into solutions, and they embed analytical results into software tools. Key questions about the future role of analytics are how to expand beyond the U.S. market and provide global support and how to create more collaboration among other analytics groups at Merck.

Notes

1 **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch17#ch17end01a) .** Micah Hartman et al., National Health Spending in 2011: Overall Growth Remains Low, but Some Payers and Services Show Signs of Acceleration, Health Affairs 32 (2013): 87-99.

2 **(http://content.thuzelearning.com/books/McNeill.2947.17.1/sections/ch17#ch17end02a) .** U.S. Department of Health & Human Services, "HHS Secretary Kathleen Sebelius Announces Major Progress in Doctors, Hospital Use of Health Information Technology," February 12, 2012, **www.hhs.gov/news/press/2012pres/02/20120217a.html (http://www.hhs.gov/news/press/2012pres/02/20120217a.html) .**