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WHITE PAPER

Making Data-driven Business Decisions Across the Medical Enterprise — Challenges and Impact

Analytics software tools in healthcare are not new, however, their utility and broad adoption is still limited. In many cases this leaves the leaders of healthcare provider organizations struggling to understand the factors that can contribute to continued improvement of their business. In addition, many analytics tools are intended only for leadership and administration and are not designed to facilitate engagement and alignment of the entire organization towards achieving common goals. This can prevent even the most effective enterprise analytics software from fully benefiting the organization.

Understanding and improving clinical, financial, and operational outcomes is a daunting task, especially without access to the business analytic tools that promote confidence in the information and facilitate in-depth discovery, understanding and consequential behavioral change. An important factor that governs the success of any improvement initiative, is the inclusion and engagement of all clinical and administrative staff. The challenge is not only generating alignment around objectives but also fostering systematic communication and trust in the information. Even today, healthy discussions among leadership and staff are often hampered by lack of trust in the underlying data. This problem is all too familiar to CIOs who are constantly dealing with application and data fragmentation.

Painting the complete picture of an organization's 'health' and prioritizing areas for improvement requires a strategy that enables decisions to be made efficiently, and supplements decision makers' expertise with meaningful and actionable information. Physician and staff engagement can only be achieved through data that is current, trusted, and complete. These are challenges that often cannot be resolved without overwhelming an organization's IT data analysts.

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MEDICAL IMAGING CHALLENGES — A PRIME EXAMPLE

The maturation of enterprise imaging as a concept and strategy has forced radiology and other clinical department leaders to examine the impact of medical imaging on the broader healthcare enterprise and not just on the radiology service itself. The following macrotrends continue to create a very challenging environment for these leaders:

- COVID pandemic hurt imaging revenue in 2020 and early 2021. Budgets were frozen or slashed.
- Technical and professional reimbursement typically only decreases. This requires an understanding of how to reduce costs, be more efficient and drive new revenue sources.
- Maturity of ACOs and value-based care models require the ability to identify and reduce costs.
- Accelerated private equity investments affecting privatization of radiology. Private equity firms need to understand current group financials and what can be done to improve profitability.
- Ongoing merger and acquisition activity intended to create stronger provider organizations. The newly combined organizations need analytics to identify improvement opportunities and track progress towards goals.
- Expansion of enterprise imaging strategies creating new data sources and integration points that must be incorporated into any analytics strategy:
    - Multiple disparate PACS and clinical IT systems across the healthcare enterprise
    - Deconstructed PACS giving rise to additional systems integration points
    - Centralized image management across clinical service lines (cardiology, pathology, ophthalmology, dermatology)
    - Increasing use of Point-of-care imaging (ultrasound, “visible light”, endoscopic procedures)
    - Imaging studies acquired in more clinical environments (ED, ICU, bedside)

ANALYTICS TECHNOLOGY CHALLENGES

Forward-thinking hospitals and health systems were once defined as those that adopt and implement technology solutions to optimize operations. Today, the healthcare landscape is crowded with technology vendors that promise to solve niche clinical, financial, or operational problems. The advent of the Electronic Medical Record (EMR) has been positive in many ways but has also created a new set of challenges for healthcare administrators, IT, and clinical staff. In addition, all healthcare organizations manage a heterogeneous mix of clinical, financial, and operational IT systems varying in age and whose interoperability often relies on paper and manual entry, and sometimes re-entry, of data.

EMR

While EMRs have enabled healthcare provider organizations to store significant portions of their clinical data in one system, they have not facilitated an understanding of the clinical and operational insights that can be gleaned from that clinical data. Typically, they still require dedicated analysts to mine the available data, which does not lead to information or insight customized for the inquirer. In addition, EMR analytics tools are typically designed to only extract information from the EMR itself, and not facilitate the integration and analysis of information stored elsewhere. Lastly, no EMR holds all clinical data across an entire health system, and it is possible that healthcare leaders do not know what information is missing from the EMR and where that data resides.

DATA SILOS

Although technology has improved clinical outcomes and provided greater access to information, it has also created new barriers in the form of data silos. During patient care, numerous clinical, financial, and operational systems are utilized, even when an EMR is in place. This is particularly true in radiology, cardiology and other medical imaging service areas that utilize specialized applications. As a result, accessing and making sense of the information stored in these disparate systems is a challenge that requires an analytics system designed to easily integrate and aggregate data from multiple silos.

LIMITED ACCESS

Adding to the complexity of data silos are vendor proprietary methods for creating and storing data. Often, the specialized skillset of a data analyst is required to write scripts that extract the necessary fields and information to create focused reports. Furthermore, these reports are often only available to a limited number of users, typically department managers and IT administrators.

DATA WAREHOUSES

A data warehouse is the traditional way to collect and integrate data to provide a central repository for generating reports. However, the aggregated data is often stale and very few organizations have successfully implemented a common information model that allows intelligent access to the data. In most cases, the ideal data warehouse solution with both real-time and historical reporting capabilities is thwarted by prohibitive costs, and the time and dedicated resources required for implementation.

INEFFICIENT REPORTING

Decisions must evolve with the changing complexity of day-to-day operations. However, without access to ad-hoc reporting, real-time data, and the ability to adjust the questions based on the changing context, decision making is drawn out and based only on historical data that is possibly no longer relevant or applicable. Solutions focused on resolving the challenges of data silos, limited access, and inefficient reporting have succeeded in their own domains – yet only a few have addressed the overall need for integrated and timely analytics.

NICHE ANALYTICS

There are also analytic vendors that promise to eliminate or reduce some of the concerns regarding real-time and historical reporting. However, almost all have opted to take the approach of carving out niche areas in which they can be successful. This approach may be valuable for industries with very few sources of data but in the complex healthcare ecosystem niche analytics solutions only exacerbate the complexity. Aggregating reports from multiple analytics vendors within the business to make an informed decision is a tedious, time-consuming, and potentially error prone task.

New healthcare analytics tools help democratize information access by enabling the entire staff to view integrated and enhanced information that is relative to their contributions.

MAKING DATA MEANINGFUL

The reality is that most health care organizations and imaging departments are drowning in data. This is because data exists in many locations yet bringing it all together is a significant challenge. Healthcare leaders and their staff must be able to compare and combine complementary clinical, operational, and financial data from disparate systems to create a holistic view of their overall business. As the saying goes you cannot manage what you cannot measure, but data comes in different forms. Simply performing measurements and gathering data is one thing but using analytics to provide customized, context sensitive insights is another.

Modern analytics software can and should enhance the value of data by framing it according to the perspective of the user and, where appropriate, by comparing real-time data with the patterns inherent in historical trend information. This is the difference between making decisions based on instinct versus intelligent insights.

When data is brought together in new ways it creates the opportunity to understand the business in new ways. While identifying and tracking key performance indicators for clinical, operational, and financial metrics are important this is a mere starting point. When data can be presented in varying contexts depending on the perspective of the user, unique insights can be attained.

For example, a radiology operations manager seeking to schedule optimal staff based on fluctuating patient volumes can only make confident decisions with a report that correlates scheduled staff hours, exam volumes and actual staff hours needed to service them. This requires merging staffing calendars with patient scheduling data, and deriving the needed capacity based on the type of exam scheduled.

THE IDEAL SOLUTION

Aggregating clinical, financial, and operational information from multiple, unrelated, data sources is far from a trivial task. The ideal solution should not only integrate data from these disparate sources, but also retain 'data liquidity' so users can compare historical trends with real-time information to discover potential improvements to their operations and business. It must also democratize business understanding by enabling all users to drill into the data to verify its integrity and to interactively discover the answers to their new questions, using an intuitive interface.

COLLABORATION TOOLS

Efficient decision-making necessitates a structured and collaborative process which tracks individual contributions to major improvement decisions. Many analytic vendors overlook the concept of collaboration within their solutions, thereby creating an efficiency improvement bottleneck. Sharing dashboards, reports and actionable insights can create a team environment in which each team member's contribution and opinions can be tracked towards each major change decision.

PHYSICIAN & STAFF ENGAGEMENT

Engagement of the entire staff is a key contributing factor to the successes of any department or organization. Successful analytic solutions must offer department managers tools to engage their clinical and operational staff that are easy to access, use, and provide relevant data in their business language – a language they understand. Personalized metrics must also be available to enable clinicians to assess their own performance compared to de-identified peers. Visualizing their individual performance allows the data to be easily assimilated and provides a positive engagement tool for self-improvement, ultimately achieving improved clinical outcomes.

ANALYTICS DRIVEN WORKFLOW

Analytics driven workflow is the emerging generation of workflow tools. New processes come to life when information is integrated from multiple sources so it can be organized and enriched to have greater meaning to each individual user, demanding and driving appropriate responses. The ability to drive user action with data, reports, and insights is the essence of analytics driven workflow.

SELF-SERVICE

The notion of self-service analytics evolves around the ability for all users to intuitively access, analyze, and view the historical and real time information that is relevant to their role – and to be able to achieve this without requiring help from a data scientist or analyst. The prime requirement of self-service analytics software is a user interface that is intuitive and does not require the user to have extensive training or skill. It must be customizable per the needs of the many clinical and administrative staff members that want and need to understand their contributions to the business. When analytics tools democratize information access in this way, staff engagement and trust in the information is created and continually enhanced through positive reinforcement. Only by providing this degree of usability will human behavior be affected, and real change follow.

SUMMARY

Analytics software tools for healthcare, and specifically enterprise medical imaging and radiology have been around for many years. However, the challenges for getting the most out of these tools persist despite the widespread adoption of EMRs. The dynamic nature of healthcare, ongoing mergers and acquisitions, and the continued existence of numerous, disparate clinical IT systems within each healthcare enterprise continue to limit the effectiveness of most business operations analytics solutions.

Today's healthcare leadership must embrace the new generation of analytics packages that are designed to overcome some of these challenges by integrating and enhancing information that can come from any number of systems. These new tools can help democratize information access by enabling the entire staff to view integrated and enhanced information that is relative to their contributions. Modern business analytics platforms like ***Foundations*** from HealthLevel are ushering in new ways to use data to understand and improve healthcare business performance.

1580 W. El Camino Real, Suite 8, Mountain View, CA 94040 | info@healthlevel.com | www.healthlevel.com
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