Making Data Driven Decisions in Radiology - Challenges and Solutions

OVERVIEW:

Among the most significant challenges that the leadership of radiology groups and imaging service providers must tackle is understanding how to achieve, and sustain business performance improvement across the organization despite the rapidly evolving business climate. Driving change that results in clinical, financial or operational improvement is a daunting task, and virtually impossible without access to detailed and accurate information that fosters organizational confidence and alignment. In addition, the inclusion and engagement of physicians & staff in achieving a unified vision and managing the change is fundamental. The challenge is not only in alignment of objectives but also in systematic communication and total trust in the information. It is well known that constructive discussions among leadership and staff can quickly be derailed by lack of trust in the data.

Painting the complete picture of the organization's 'business health' while prioritizing areas for improvement requires a strategy that enables decisions to be made efficiently by supplementing decision makers' expertise with meaningful and actionable information. Physician and staff engagement can only be achieved through data that is current, accurate and complete, but this is difficult to achieve without overwhelming your IT data analysts. This is a challenge faced by all healthcare executives today.

MEANINGFUL DATA

The most meaningful decisions can be achieved by obtaining real-time, context based insight, from data sources within the radiology group practice and from client systems. Usually, wide and varied information is necessary to make informed and confident decisions, requiring a blend of clinical, financial and/or operational information that is viewed in the context of the question that is being asked. For example, an operations manager seeking to schedule optimal staff based on fluctuating patient volumes is likely to make confident decisions with a graphical report that correlates scheduled staff hours, exam volumes and the actual staff hours needed to service them. Accomplishing this requires merging staffing calendars with patient scheduling data, and

Analytics:

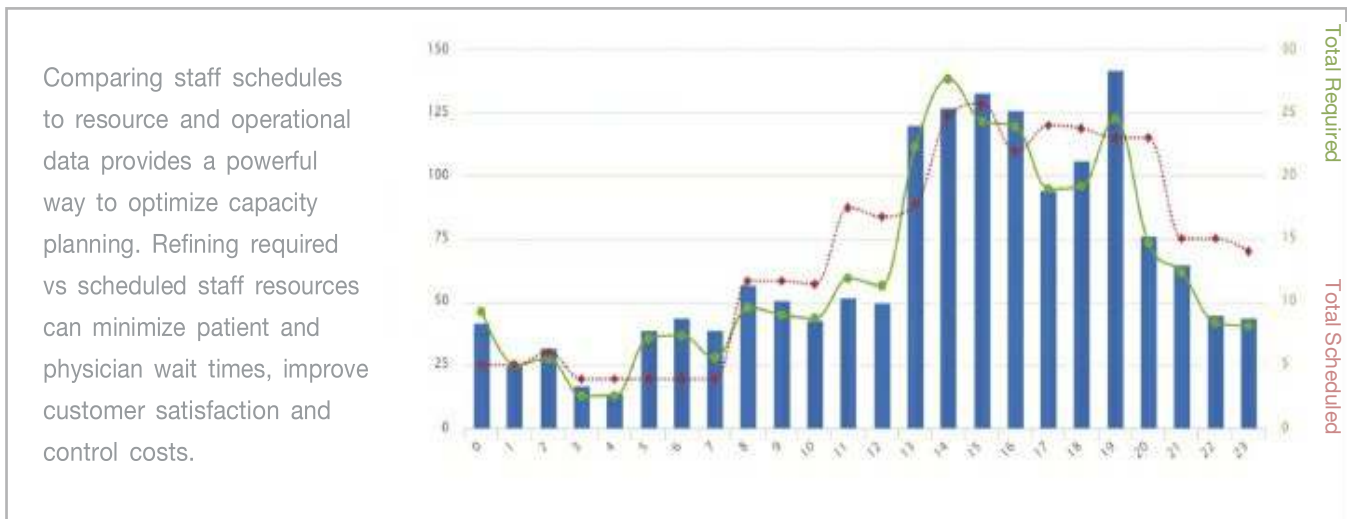*The discovery, interpretation and communication of meaningful patterns in data.*

Discovery is the process of observing or uncovering previously unknown information.

Interpretation is the process of assigning meaning and value to new information.

Communication is the process of conveying the meaning of new information to those who can benefit.

deriving the needed capacity based on the type of imaging study scheduled. Observing historical trends in this scenario (see figure 1) can bring forward outliers that may answer pending questions like "how can I avoid overtime hours and over-staffing?"

Adopting integrated analytics solutions resolves the issue of insufficient data -- however, in today's competitive landscape, solutions that promote information discovery and actionable insight are necessary to enable efficient and confident decision making.

Comparing staff schedules to resource and operational data provides a powerful way to optimize capacity planning. Refining required vs scheduled staff resources can minimize patient and physician wait times, improve customer satisfaction and control costs.

TECHNOLOGY CHALLENGES

Forward-thinking radiology groups and imaging services providers used to be defined as those that adopt and implement the latest imaging modalities and productivity enhancing tools. To be one today, organizations must adopt IT systems that enable them to understand and optimize their clinical, financial and operational performance, and communicate this effectively across their organization as well as to their customers. Change management and the requisite decision-making demands a detailed understanding of the improvement opportunities in these key areas.

DATA SILOS

Although healthcare information technology has significantly improved staff productivity and access to imaging information, it has also created new barriers in the form of data silos. Throughout the imaging process, a variety of clinical, financial and operational systems interact, creating and storing valuable information that can be harvested for actionable insight. However, this information is often housed in disparate locations and systems that typically do not communicate with one another, thus adding to the difficulty of aggregating data for reports and analytics. While the adoption of vendor neutral archives may have reduced the number of these data silos, many still exist among the PACS, RIS, voice recognition, critical results reporting and dose tracking systems that are commonly used.

LIMITED ACCESS

Adding to the complexity of data silos are the vendors' proprietary methods for creating and storing data. Specialized skillsets of experienced database administrators are required to write scripts to extract the necessary fields/information to create focused reports. Furthermore, these reports are often only available to a limited number of users, typically department managers and IT administrators.

This challenge is compounded when attempting to incorporate information from IT systems owned by the organizations who have contracted out their imaging services to the imaging services provider. Security and interoperability issues can easily limit access to such valuable information.

INEFFICIENT REPORTING

Through appropriate resources, leadership can obtain reports (typically spreadsheets) to answer their pending questions, but often at the expense of missed timeframes. The significant overhead required to manually generate reports and revise them to meet the specific needs of all stakeholders is an added expense most radiology groups cannot afford to maintain.

Decisions must evolve with the changing complexity of day-to-day operations and address the unique needs of individual customers. 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 potentially no longer relevant or applicable.

Application vs. Departmental vs. Enterprise Analytics

Application analytics are reports based on data generated from within the application. Sometimes useful, but often not sufficient.

Enterprise analytics often point to data warehouses that collect data from across the organization. Great for population health and revenue cycle. Often run on day old data. Not suitable for running a business in real time.

Departmental analytics use real time and historic data from all systems in a department. Perfect for clinical, operational, and financial insights.

DATA WAREHOUSES

Every year, more vendors enter the analytics market to solve the data silo problem by aggregating data; often only focusing on the 'systems that matter' (EMR, RIS, PACS, Billing, etc.). These solutions provide organizations with a way to connect their chosen data sources to a central data warehouse, which can be used as a repository against which reports are run. Despite the intent to provide the continuum of historical information, the aggregated warehoused data is often stale, and very few organizations have successfully implemented a common information model enabling intelligent access to the data. In most cases the ideal data warehouse solution with both real-time and historical reporting capabilities is thwarted by the challenge of capturing data that exists in disparate systems, prohibitive costs, and the time and dedicated resources required for implementation.

TARGETED USER GROUP

Reporting solutions are often very focused on providing information for IT analysts and system administrators– but what about management, radiologists and staff? Many analytic solutions today fail to provide an intuitive and interactive experience that can be optimized to meet the individual needs of all users across the organization. Furthermore, many of the decisions made by radiology group leadership these days are focused on achieving operational change. This requires the involvement and buy-in of the radiologists, technologists and support staff whose new behavior must support the initiative. Therefore, it is crucial for any solution to place information in the hands of all impacted users in an easily understood manner that speeds their ability to act on it.

THE IDEAL SOLUTION

Aggregating clinical, financial and operational information from many-fold unrelated data sources is a challenging task. However, the ideal solution not only integrates data from these disparate sources, but also retains 'data liquidity' so users can compare historical trends with real-time information to discover potential improvements in their business. It must ignite confidence in the users by allowing them to drill into the data to verify integrity and to interactively discover the answers to new questions, using an intuitive interface.

D.I.Y.

Data warehouses and enterprise analytics can be quite expensive, particularly when you factor in the total project costs including your stretched and precious IT resources.

It doesn't have to be that way. Self-service analytics are here, enabling authorized end-users to create and modify their own reports. For this to be effective, the analytics tool must have an intuitive UI and a metadata format for their discovery tools. This will free IT from having to be involved in the departmental analytics reports.

DATA LIQUIDITY

Obtaining information in the context of the question is a key distinction between analytics and reporting. The most successful vendors have developed solutions that can aggregate information from internal and external data sources and make it available as a set of measures and filters for their users. Bringing data together is key, but demonstrating data liquidity without compromising the value is an important differentiator between vendors who promise analytics, and those who deliver.

COLLABORATION TOOLS

Collaboration often happens through emails, meetings and reading room conversations. However, efficiency in the decision-making process necessitates a more structured collaborative process which tracks individual contributions to major improvement decisions. In addition, collaboration must span functional teams and organizations with the goal of facilitating understanding and problem solving. This must include all data from all organizations being serviced by the radiology group or imaging services provider. A more comprehensive picture empowers collaboration and improvement across the virtual organization, benefiting all who are involved.

Most analytic vendors overlook the concept of collaboration within their solution, thereby creating an efficiency bottleneck. Sharing reports and actionable insight can foster a team environment in which each team member's contribution and opinions can be tracked thus amplifying the opportunities for improvement.

RADIOLOGIST, TECHNOLOGIST & STAFF ENGAGEMENT

Engagement of the entire staff is a key contributing factor to the success of any organization. Effective analytic solutions must provide leadership the tools to engage their clinical and operational staff: that are easy to access, use, and provides data that is relevant and in the user's business language. For example, providing personalized analytics to allow for de-identified comparisons between themselves and their peers enables staff to identify areas of self-improvement. These types of personalized metrics also provide a unique tool for radiologists to assess their contribution to clinical outcomes vs. de-identified peers. Visualizing the true data of their individual performance allows the data to be easily assimilated and provides a positive engagement tool for self-improvement, ultimately enabling greater clinical engagement and value.
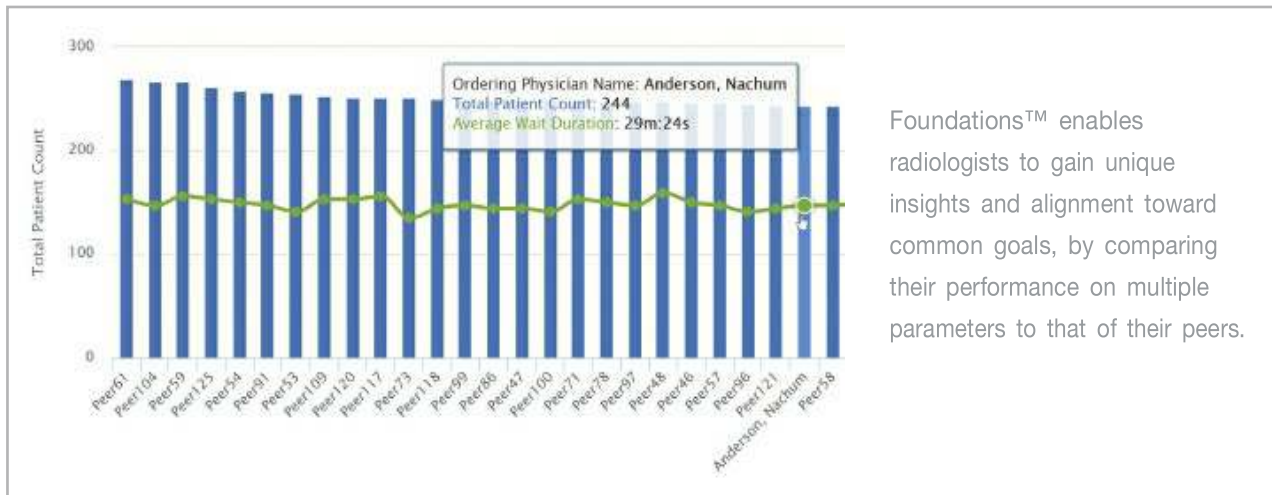
Foundations™ enables radiologists to gain unique insights and alignment toward common goals, by comparing their performance on multiple parameters to that of their peers.

DATA GOVERNANCE & USER SECURITY

Vendors market their products as HIPAA compliant and secure. When confined to a restricted small groups of users, this is easy to achieve. However, the success of an analytic solution will be dictated by the set of tools provided to IT and system administrators to easily manage users, data streams and content. The ideal vendor should provide analytics for the masses, so user security is a key component. Providing role-based access reduces the burden on IT and system administrators to constantly monitor user activity and change security levels, on demand. Providing role based access ensures that all users with identical roles (i.e. nurse, management, etc.) will see data in a context that is relevant to them.

USE CASE SCENARIO:

START WITH OPERATIONS

Operational efficiency is key to ensuring that a group functions at optimum capacity. For example, quality reporting, modality idle-times, and variances in case load play an important role in ensuring smooth operations. However, management continued to struggle to obtain appropriate data to fully understand the impact of each parameter on the overall outcome. A major radiology group practice that reads for their own imaging centers and for hospital clients implemented an analytics solution to tackle the issues mentioned above. By implementing a platform that aggregated information from their PACS, RIS, Reporting, billing, dose monitoring and quality reporting systems, management was able to obtain case level workflow details and create ad-hoc reports, using a variety of metrics, to assess their operational efficiency. With increased use and changes to workflow to limit the number of

delayed cases, management and leadership began a quality initiative to improve workflow documentation. Over a six-month period, the organization improved their workflow and documentation quality by 90%, leaving only a few outliers that required revisiting.

EXTEND TO THE STAFF

The client had also struggled to understand, and act on study specific operational delays. To help address this challenge, leadership extended their analytics product to their radiologist and technologists, providing them with personalized metrics that allowed each individual to understand their operational or clinical performance against a de-identified peer group (based on role). Within the first month, management observed that these individuals began suggesting ways to reduce contrast usage, radiation dose, improve documentation efficiency and the tracking of clinical complications.

UNDERSTAND BILLING & COLLECTIONS

To understand the full scope and obtain the complete picture under one analytics solution, another organization implemented a financial analytics module to correlate with the already present clinical and operational data. Prior to adopting the analytics platform, each department manager, as well as their leadership, relied solely on email and phone communications to understand, discuss, and communicate collections & charges. For the simplest questions management had to write emails to the financial staff detailing patient ID, date of service and imaging study details. In addition, management did not have a complete picture of the types and amount of charges billed and collected for each component of the performed procedures. The financial module of the integrated analytics solution added a collaboration capability between management and financial staff at the case level. The resulting centralized solution associated all communication details such as charges, credits, collections and discrepancies with each case so that historical references remain intact and complete.

Digital Replica

Use your data to create a "digital replica" of your business.

A digital replica plus analytics will enable you to make your clinical, financial and operational performance highly visible and easily understandable.

ACHIEVING THE RESULTS

After six months both organizations reported that they were providing a much higher standard of care for their patients:

- Reduced exam delays
- Reduced contrast usage & in-room complications
- More efficient workflows
- Improved documentation quality
- Improved staff engagement
- Improved modality utilization rates
- Decreased variation in study times
- Increased understanding of active, expiring and used inventory
- Improved collaboration between management and financial staff
- Improved collections rate for charges billed

CONCLUSION

An efficient, user friendly analytics and business management platform that integrates historical and real-time clinical, financial and operational information is critical for improved decision making, planning, staff engagement, and operational efficiency. Prior to adopting any analytics solution there are several things to consider: the solution must demonstrate flexibility in achieving actionable insight from the aggregated datasets, it must provide a user friendly interface for mass adoption across the enterprise, it must enable role-based interaction to have relevance to each user and it must provide the ability to combine metrics and enable drill down reporting so that leadership decisions can be most effectively implemented, in a timely manner. Throughout the selection process, leadership must include IT administrators, data analysts, as well as management and clinical staff to ensure that the solution provides value to all levels of the organization. The chosen tools must be easy to deploy and maintain so that burden on already time-starved administrators is reduced. Another must is that leadership, management and staff can, in context, equally, and quickly, glean the necessary information from the data that is their business. An analytic solution that provides a source of truth for a complete picture of a radiology groups 'business health,' and reveals areas for improvement, will allow decisions to be made efficiently, supplementing decision makers' expertise with meaningful and actionable information.