Decoding Your Business Intelligence Dashboard

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Discussion Objectives:

1. Define what Big Data and Business Intelligence means in Healthcare
2. Examine mechanisms to harness your data
3. Understand dashboards and what they access
4. How to decode what you're seeing

Define Big Data and What It Means In Healthcare

"Big Data" – a term created to describe datasets so large that they are beyond the ability of common applications and software tools to organize, capture, manage and process them in an acceptable amount of time.

Other terms to familiarize yourself with:

- *Exabyte – became commonly used in 2012. Equates to one million terabytes, which in turn is one million megabytes*
- *Business Intelligence – software applications that provide a mechanism to mine, process, analyze, query and report on raw data*
- *Key Performance Indicators – common or uncommon metrics that are used to determine and measure the relative success of certain business processes or departments*

Define Big Data and What It Means In Healthcare

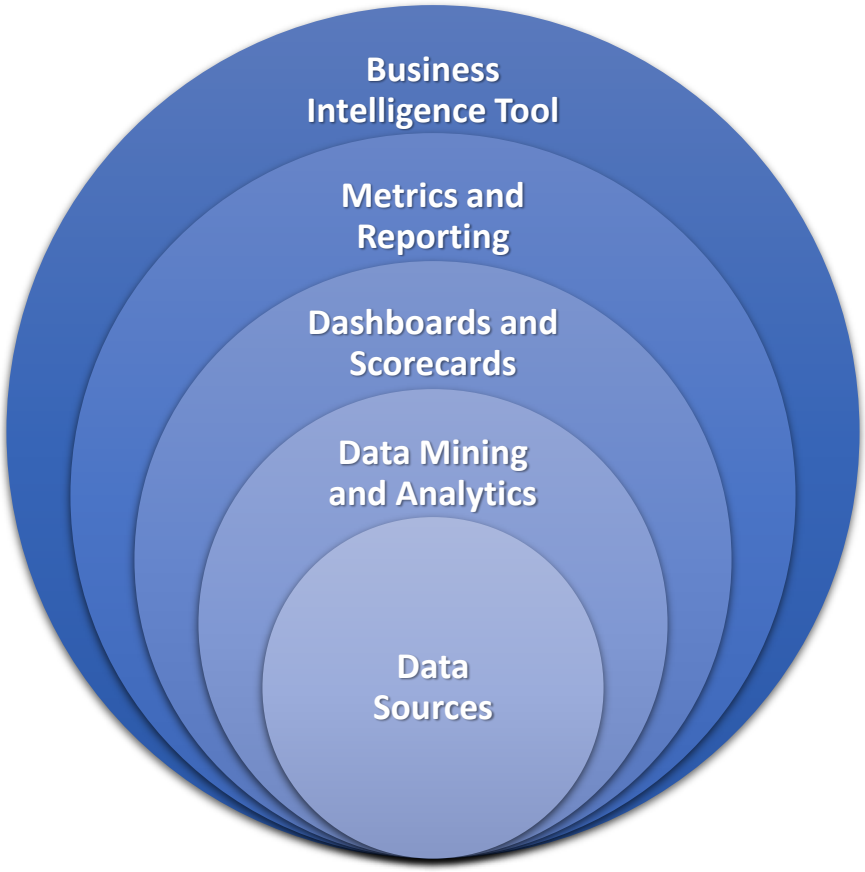
Worldwide, there are over 2.5 *exabytes* of new data created every day!

Examples of Data Sources in Healthcare

- *Patients*
- *Hospitals*
- *Physician Offices*
- *Freestanding Emergency Rooms*
- *Urgent Care Centers*
- *Imaging Centers*
- *Ambulatory Surgery Centers*
- *Cancer Centers*
- *Labs*
- *Payors / RBMs*

What is "Actionable Data?"

A proper Business Intelligence solution creates a reporting "halo" that provides clinical managers the actionable information with which to make informed operational decisions



The idea of making informed decisions on how we manage practices and healthcare facilities is not new…HOWEVER:

Informed decisions historically have been based on anecdotal observations, bottom line income, personal experience or even just intuition.

Sometimes it is based on historical data that is not relevant to today's operating conditions.

Data, and the ability to collect, transform, understand and implement change based on that data, is changing how successful organizations are managing their businesses.

Our process, as an industry, needs to evolve. Business Intelligence tools are providing this opportunity and there are three primary goals:

1. *Develop actionable intelligence from a sea of raw data*
2. *Provide previously impossible integration across systems*
3. *Create a foundation for predictive analytics*

So what do we do now?

PACS

RIS

Finance

Reporting

Billing

Market Information

Data Transformation Engine

2 Key Elements to any BI system:

1) *Seamlessly navigate and perform analytics across multiple data platforms / sources*
2) *Mine and report on data in real time*

We figure out what we need to measure, what metrics we need in order to measure it, and we apply a data transformation engine to give us dashboards and REAL-TIME views of our operations.

Systems That Can Be Accessed

Think about the systems we use daily in the medical imaging industry every time a patient gets scanned:

- *HIS*
- *RIS*
- *PACS*
- *Billing*
- *EMR*
- *CRM*
- *Scheduling*
- *Pre-authorization*
- *Financial Reporting*

Now consider that each system has its own generally proprietary database that includes data on:

- *Equipment*
- *Diagnosis*
- *Procedure*
- *Insurance*
- *Patient*
- *Attending Physician*
- *Referring Physician*
- *Radiologist*

There are approximate 445 million diagnostic exams performed in the US each year!

Source – Truven Health Analytics, Outpatient Procedure Estimates, 2011

Operational Metrics to Guide Operations

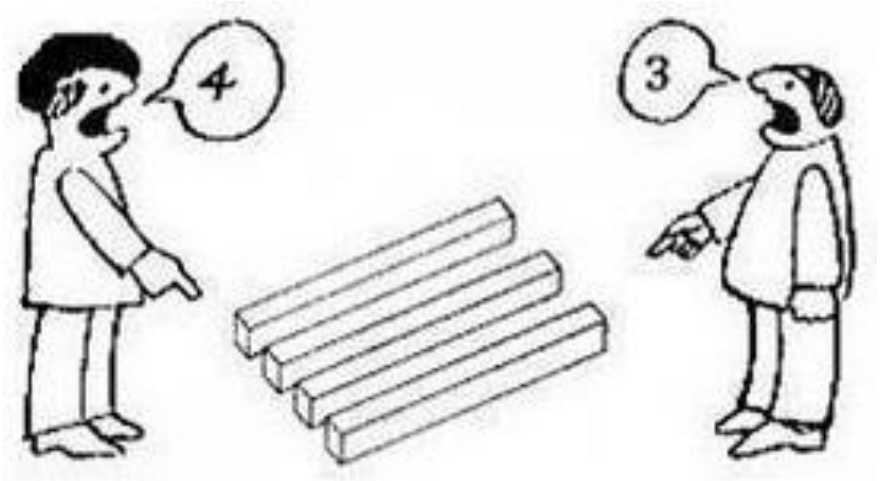
Old Way:

1. *Determine what you're trying to measure or report*
2. *Determine what system(s) contain the source data elements*
3. *Request IT System Administrator to query and generate report*
4. *Waiting period – could be as much as 3 to 4 weeks*
   a) *Review report for interpretation of request*
   b) *Review report for accuracy of data*
   c) *Revise request and wait for IT to re-query system(s)*
5. *Singular data set now available in excel*
   a) *Size limited by number of rows and columns in Excel*
   b) *Not relational or real time*
   c) *Unable to drill down in any type of "root cause" analysis*
6. *Create and format best useable summary for review*
7. *Use this now "standard report" weekly, monthly, etc.*

Operational Metrics to Guide Operations

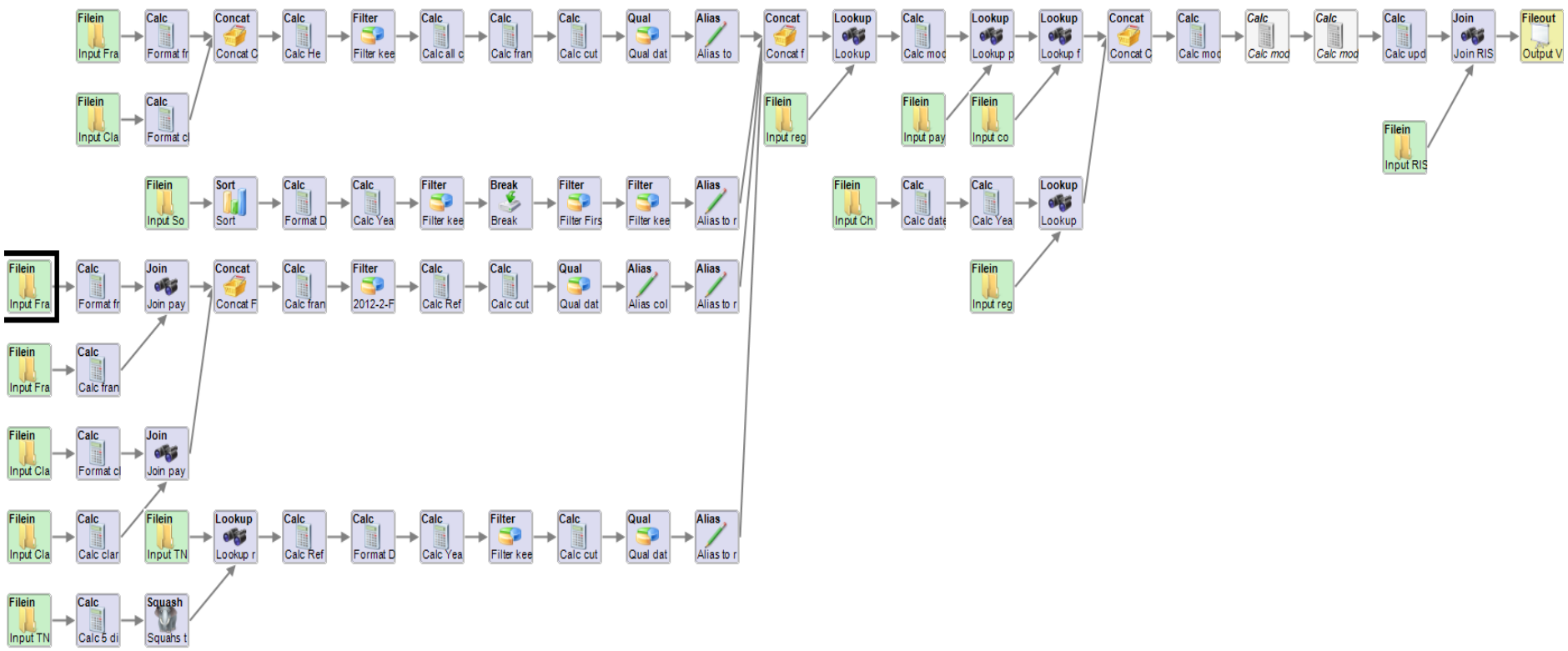
Significant Problems with the Old Way:

1. *Data is "old" by the time it gets to your summary report*
2. *Leads to reactive rather than proactive and strategic decisions*
3. *Very limited ability to query and match data across sources*
4. *No predictive or real time algorithms or integrations*
5. *No transparency into "Root Cause"*



End Result: Incomplete or conflicting information with which to make operational changes

Operational Metrics to Guide Operations



New Way: One time data integration that feeds continuously updating "live" dashboards with drill down ability across multiple systems throughout the enterprise.

Operational Metrics to Guide Operations

Advantages with the New Way:

1. *Managers don't waste time compiling and summarizing data*
2. *Provides real operational insight with real time feedback*
3. *Seamlessly applies cross platform analysis of data sources*
4. *Perform "Root Cause" and predictive analyses - automatically*
5. *Convert raw data into actionable information*

End Result: The extraordinarily difficult task of integrating multiple data sources becomes a much simpler series of equations and your BI tool can fill in all the variables!

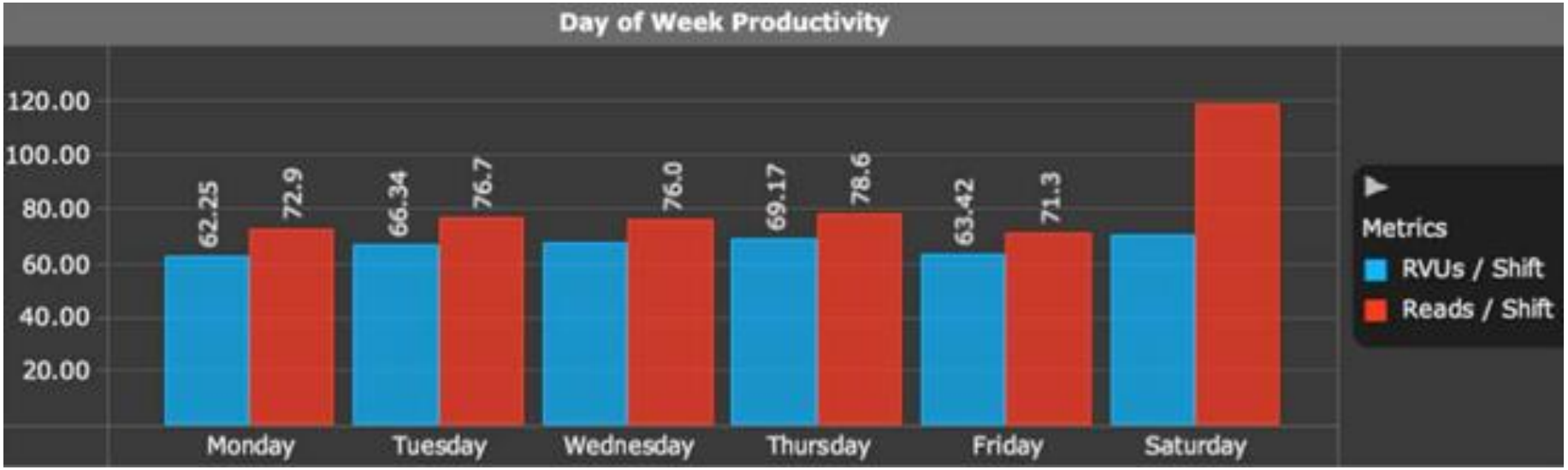
Examples of Operational Dashboards

Department Managers can review:

1. Patient Satisfaction
2. Wait Times
3. Post Care Visits
4. Avoidable Readmissions

Reviewing this data over time and with trend lines allows for the determination of corollaries between patient satisfaction and additional downstream care (cost)

Examples of Operational Dashboards



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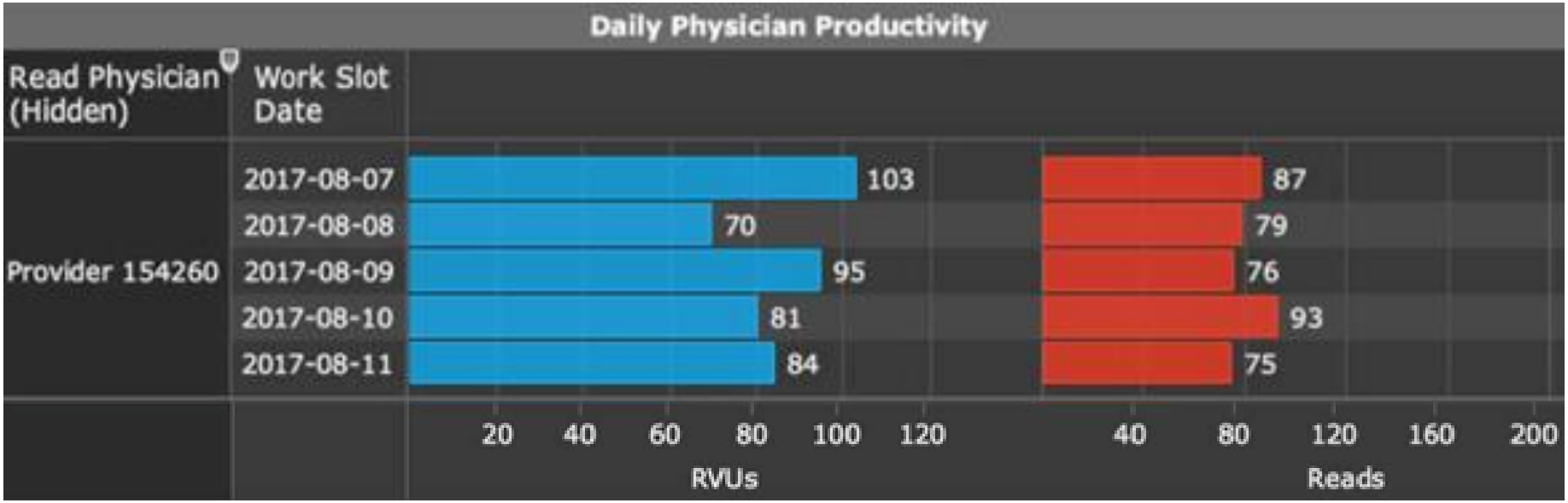
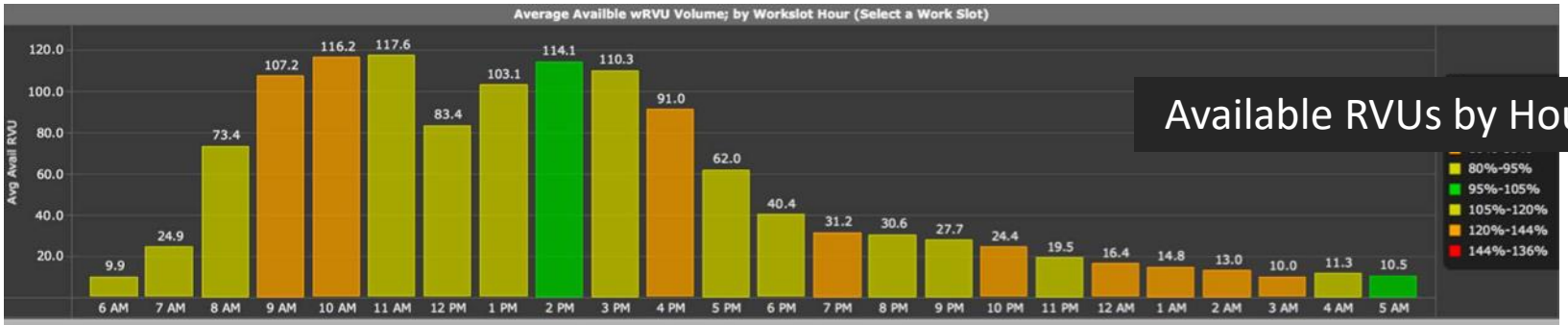


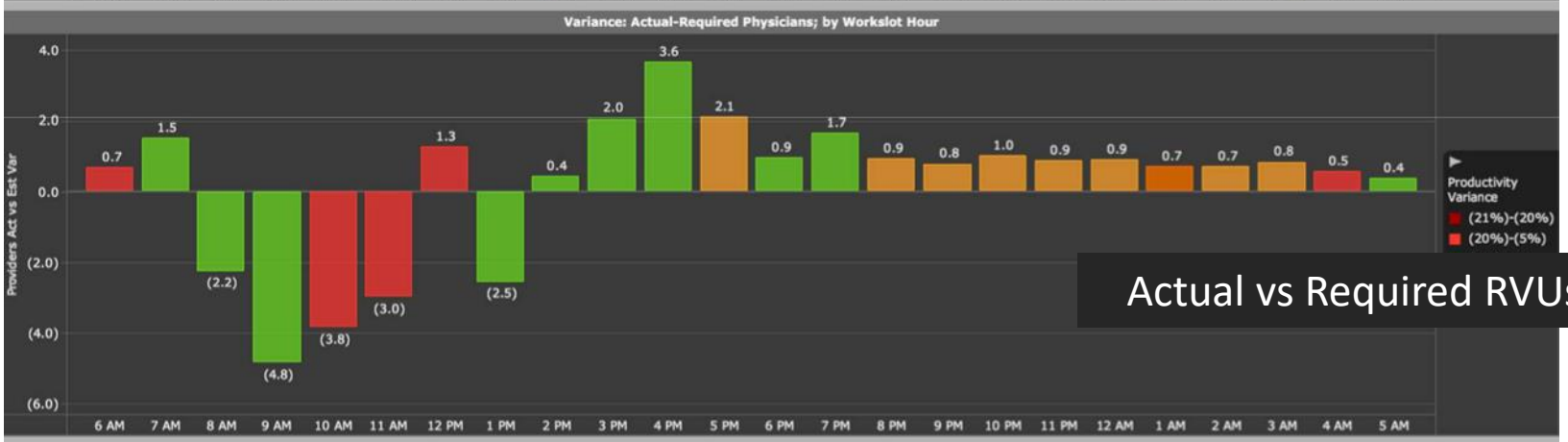
Daily Physician Productivity

- Measure volume and productivity by shift and day of week
- Monitor productivity of physicians and observe trends over time
- See if there are explainable increases or decreases and underlying trends
- Make changes in scheduling or staffing based on case counts and RVUs
- Real time access to scheduling and over/understaffing of physicians
- Manage physicians schedules to accommodate demand

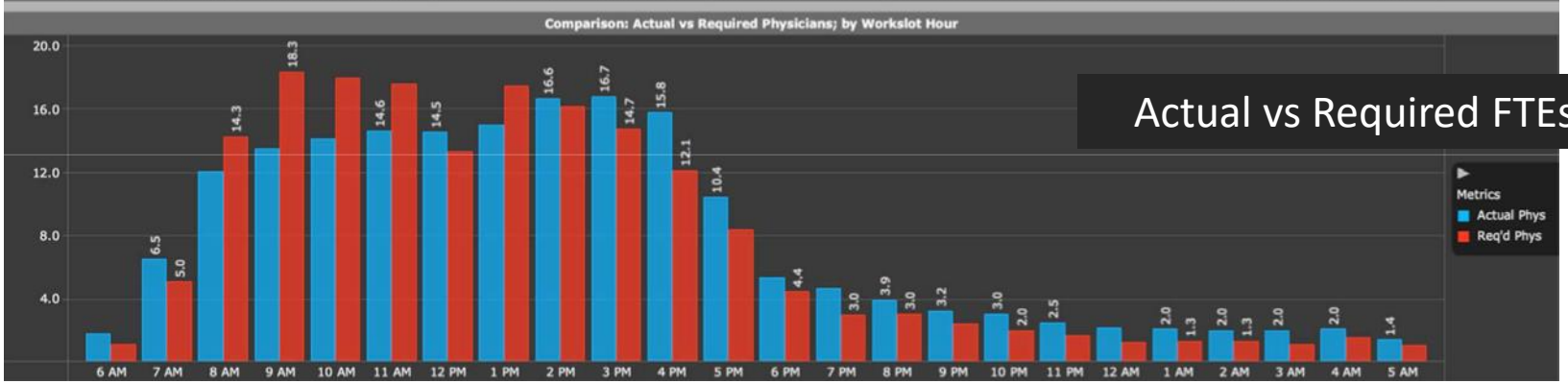
Examples of Operational Dashboards



Available RVUs by Hour



Actual vs Required RVUs



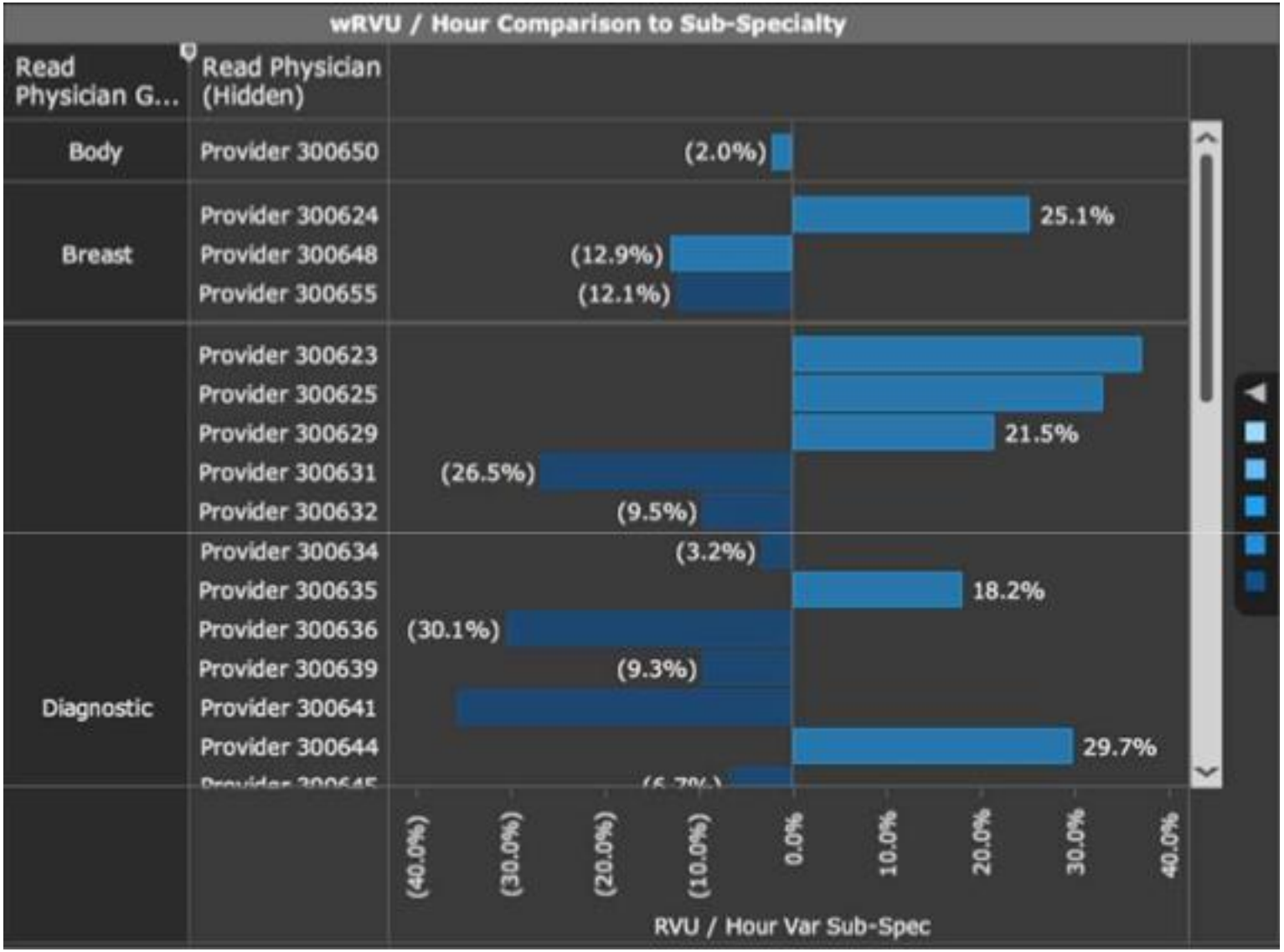
Actual vs Required FTEs

Conclusions From Productivity Dashboards

Shift and Productivity Analysis:

- Effectiveness of individual shifts
- Effectiveness and historical trending of individual physicians
- Demand for additional or reduced staffing during different shifts / hours of the day
- Comparison of equality of productivity across the group

Examples of Operational Dashboards



Conclusions From Subspecialty Dashboard

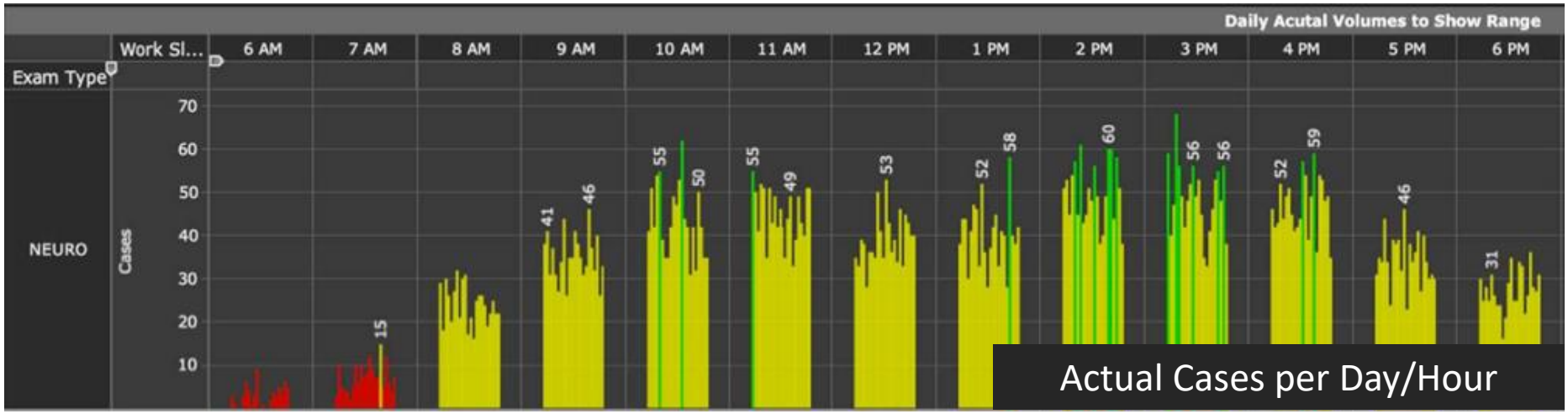
Subspecialty Analysis:

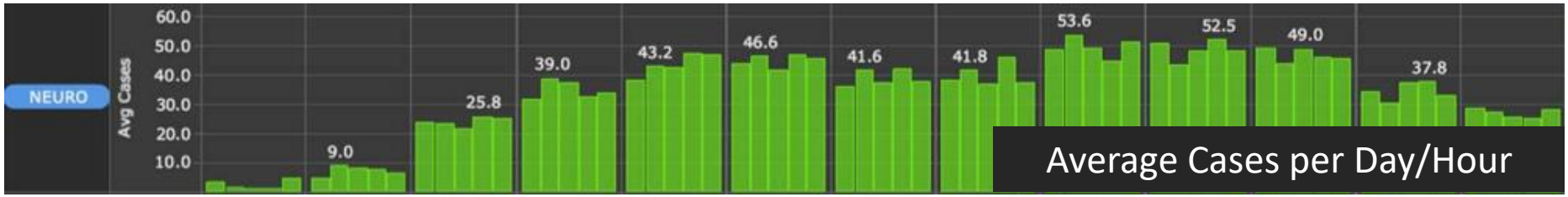
- Are we meeting the expectations of our hospital partner
- How effective are we at directing subspecialization to the appropriate physicians
- Do we need to consider increased subspecialization or are we providing adequate specialized interpretations
- Where and how do we recruit to manage subspecialized volume

Examples of Operational Dashboards

Average Cases/Day by Modality

Examples of Operational Dashboards



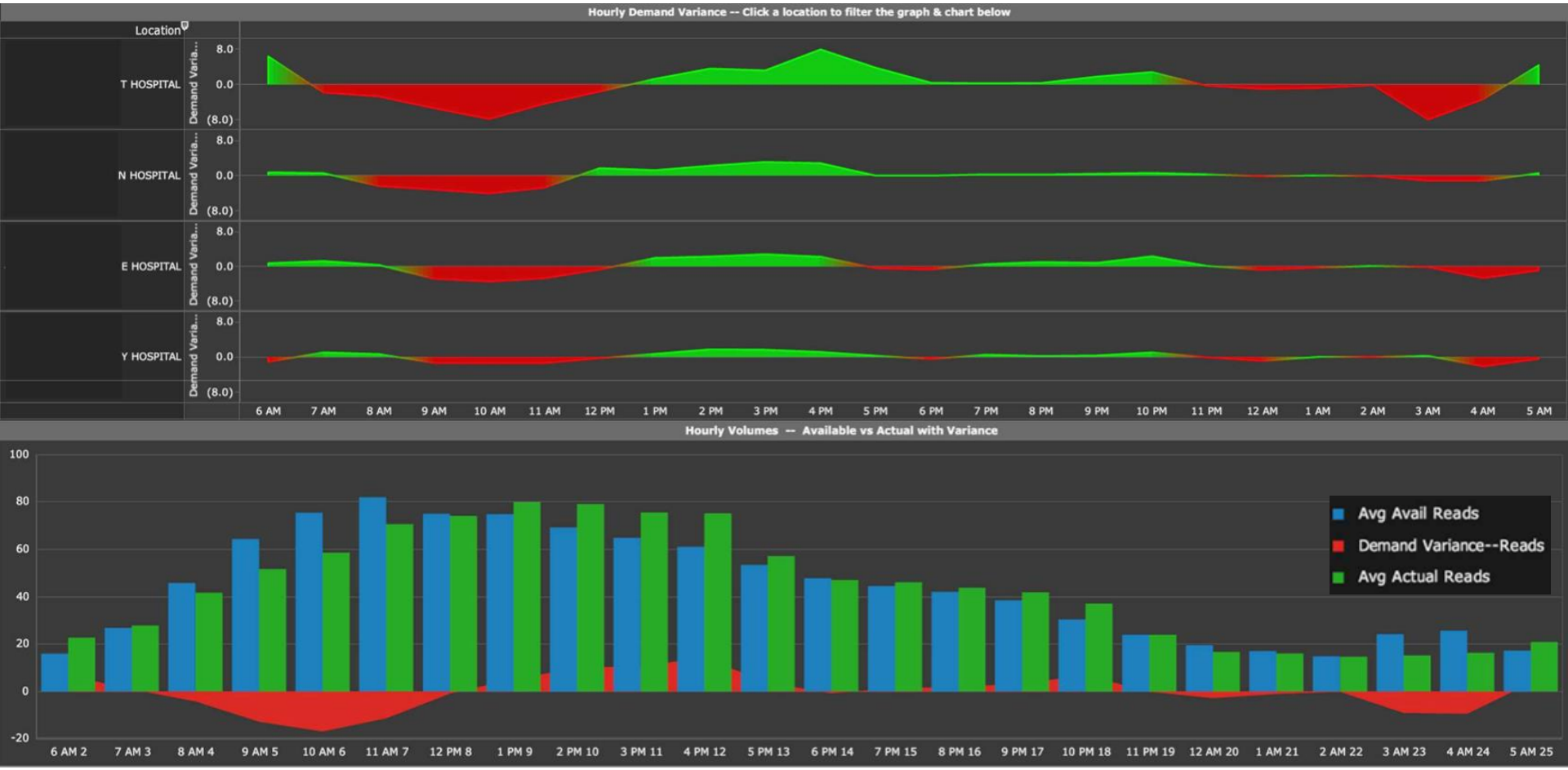


Conclusions From Modality Dashboard

Volume by Modality:

- Do particular modalities require additional staffing during certain hours or days of the week
- Are we appropriately staffed to handle evening and nighttime stat or emergency cases
- At what point do we increase staffing to account for outliers that have become the norm
- If we staff for the average case count, we are significantly short staffed on busy days

Examples of Operational Dashboards



Managing multiple locations:

- Physician staffing can be maximized for demand
- By hour of day, what is the ratio of actual reads to available reads

The Holy Grail of Data in Healthcare

Metrics: measures that define an organization's behavior and performance. Metrics support a range of stakeholder needs from customers to shareholders to employees.

Analytics: the discovery and communication of meaningful patterns in data. Analytics relies on the application of statistics, computer programming, and operations research to quantify performance.

These two terms are systematically interwoven. While often times used interchangeably, you cannot have one without the other!

What does this mean for Radiology Practices?

- Report turn around times
- RVU productivity by physician
- Marketing and referring physician information
- Quality reporting
- Automated follow up on secondary findings
- Capacity and use of equipment
- Schedule vs actual staffing for physicians
- Support staff levels by hour of day
- Subspecialized read percentage
- Clinical decision support
- Utilization management and appropriateness

Business Intelligence Process

Business intelligence creates an opportunity to develop previously untapped metrics that can change how we operate, how we provide patient care, and ultimately, the outcomes of our patients. We have the technology to mine virtually any data set that exists in your enterprise today. Don't waste it!

1) Find a Business Intelligence platform that meets your organization's needs
    a) Consider cost, complexity, ease of use, etc.
2) Define the metrics that are critical for your operations
    a) Consider engaging outside resources to assist in creating measures you might not have previously considered
3) Measure the results before and after operational changes are made
4) Use your BI tool to continually monitor operations and be proactive in addressing any concerns or issues

Thank You

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