

Deploying Artificial Intelligence (AI) enabled technology to improve productivity, financial performance and quality

If you would like assistance working on improving care efficiencies, optimizing workflow and reducing labor expenses without cutting staff, please contact me for a free analysis of your organization.

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Jason Palmer, CEO, Teamwrks AI – RVH Solutions, Member HFMA US

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Background: Rizk Ventures: Special Situations Investment Group

1. Healthcare Technology and Artificial Intelligence

RVH Solutions

- *AI Technology to Support Healthcare Operations and Improve Quality.*

TractManager- EXITED

- Leader in providing technology-based contract management solutions to healthcare organizations.
- Served over 25% of the hospitals in the US, with more than 130,000 end users at over 5,000 locations.

Classroom24-7



2. Healthcare Real Estate/Hospitals

Workspace Property Trust

- Commercial real estate company with over 147 properties and 9.8 Aetna, largest healthcare tenant

GSRVC

- GSRVC was established in 2015 as a joint venture between Goldman Sachs Special Situations Group to invest in healthcare real estate in the country of Colombia.



3. Healthcare Operations/Consulting

National Clinics

- Organization dedicated to the delivery of health services through a network of hospitals, clinics, and healthcare providers.

CHTCS

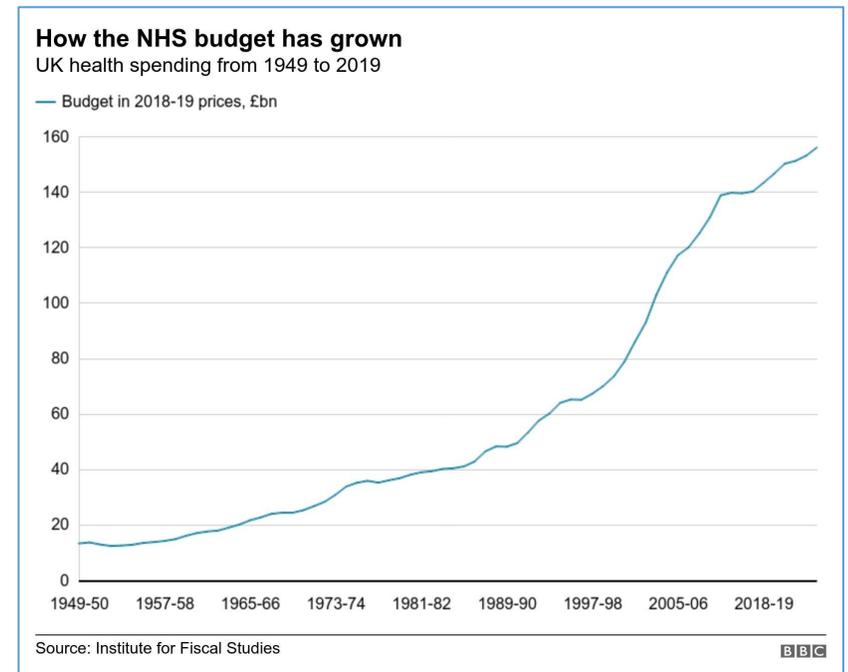
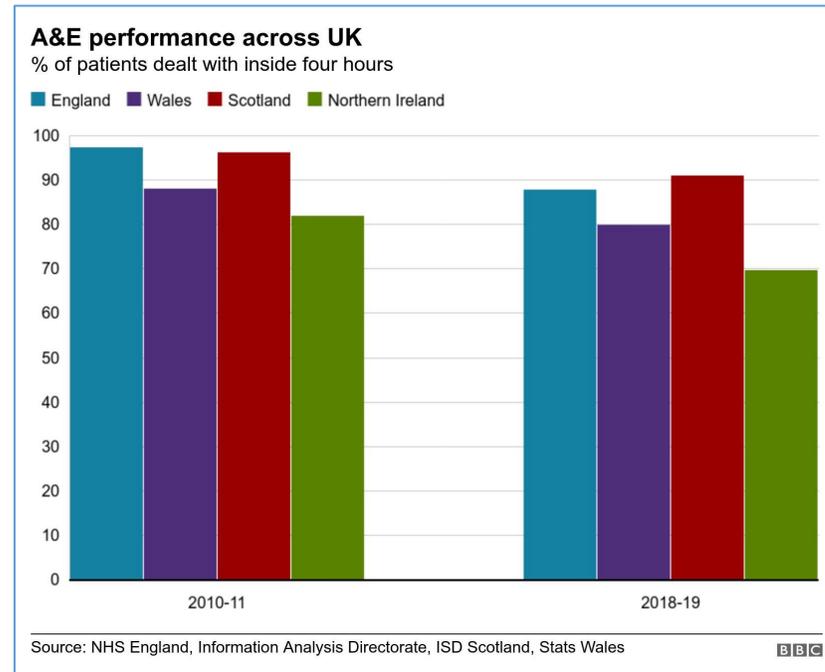
- Counter Human Trafficking AI Technology and Services Organization.
- Corporate Compliance and Supply Chain Management

Our prior healthcare technology, TractManager, served over 25% of the hospitals in the US, with more than 130,000 end users at over 5,000 locations.

**A Clear Trend:
Health Leaders
have always
been asked to
do more with
less.**

**The financial
challenges
facing hospitals
today require
leaders to
make smart
and innovative
operational
changes.**

- Since 2012, at least **25% of US hospitals have been losing money from operations.** By 2020, approximately 1 in 5 hospitals will be sold, closed or merged
- The **UK has seen changes as well** with increases in budget and poorer throughput



COVID-19 has created additional, unprecedented challenges.

Hospitals are now facing significant surges in volume and labor needs.

*White paper from PWC on economic update for UK in relation to COVID-19

- The impact of the virus has overwhelmed health care in several countries **forcing them rapidly reallocate existing resources** to ensure quality and support front line staff. (A hospital in CA had to send home 36 nurses on self quarantine due to one COVID patient).
- March 1, 2020 to June 30, 2020, Estimated \$202.6 billion in losses for America's hospitals or \$50.7 billion per month. **Large number of hospitals furloughing workers in response to COVID.**
- 7.6 Million jobs or 24% of the UK Workforce is at risk due to COVID Related Impacts. **This includes 10% of healthcare related jobs.**
- NHS Waiting List (for treatment) **could reach 10 Million this year**, due to delays in care.
- Medefor, a provider of virtual healthcare to National Health Service (NHS) patients, forecasted that the **waiting list for NHS treatment would swell from a record 4.4m people in February 2020** to 7.2m by the end of September. Research (University College London) suggests that delays in treatment/diagnosis of cancer could lead to almost 18,000 extra deaths.
- Across the 60 countries covered by the PWC forecast, we expect total **healthcare spending to rise by 5.5%** in US-dollar terms in 2021

**Healthcare
leaders are faced
with increasingly
complicated
challenges.**

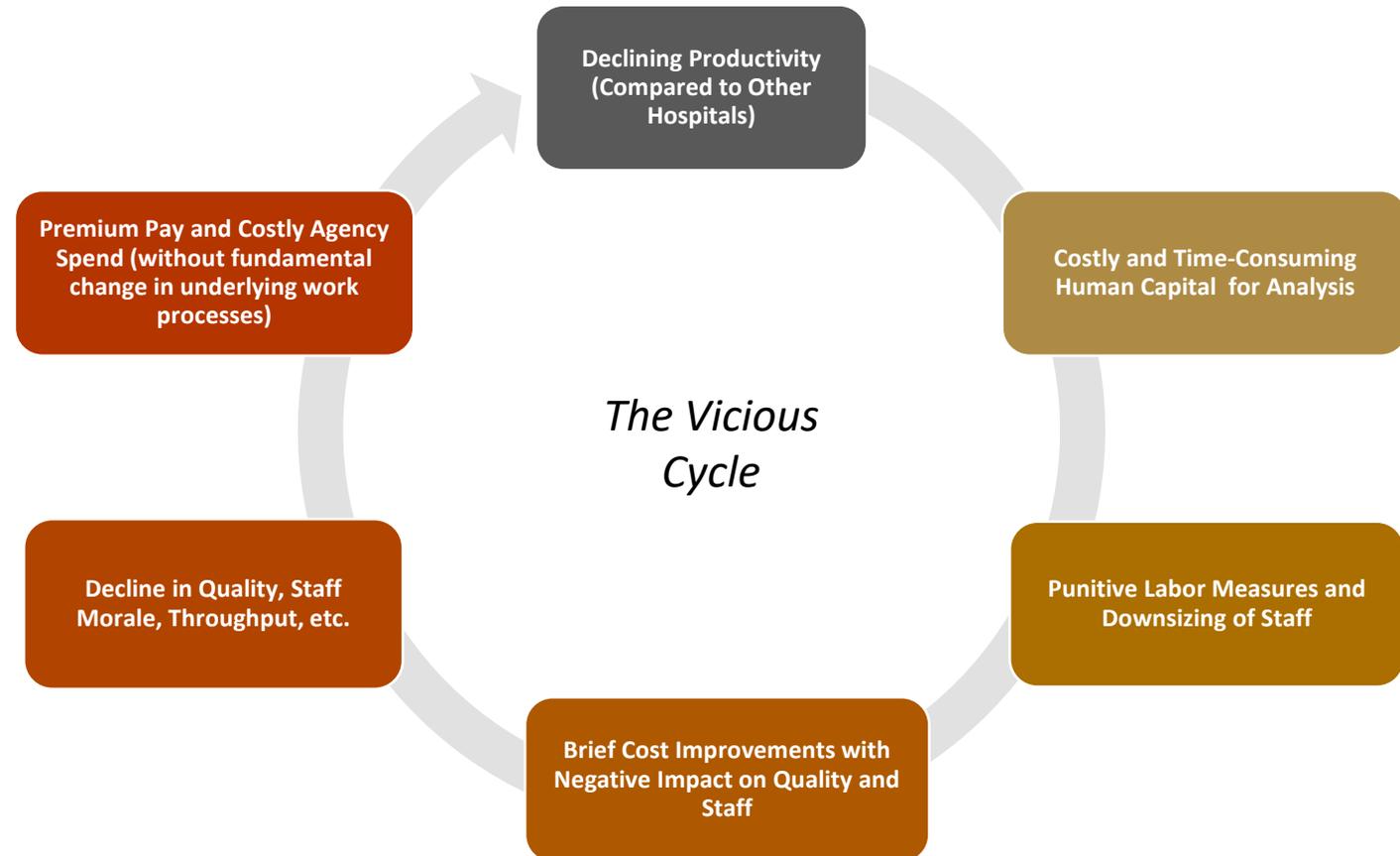
**Yet they are often
given far less
support than
other industries.**

Existing analytics measures and efficiency strategies use external benchmarks that:

1. Fail to provide actionable intelligence, and
2. Make it difficult to identify opportunities for value creation

Existing strategies for operational analysis and improvement:

1. Often require significant human capital (or a large number of costly consultants), and
2. Focus on labor downsizing to reduce costs, risking quality & making change unsustainable



Technology Plays a Critical Role in Supporting Leaders and Subject Matter Experts:

Health leaders must be able to rapidly (and remotely) identify ways to significantly improve financial and quality performance *WITHOUT* attacking staff.

Healthcare leaders must be given innovative resources to expand band-width, distribute work and reduce burden.

You can NEVER take the people out of healthcare.

However, technology, when properly applied, can support the people's work, allow for rapid remote analysis and help drive an engine of continuous improvement.



Reduce Friction and Burden on Leaders and Staff



Monitor Adaptability. Ensure High Reliability & Quality



Increase Sustainability Broaden Staff Engagement

What is Artificial Intelligence (AI)?

Analyzing variation and coalescing patterns requires the review of discrete data sets more frequently and granularity than can be done “by hand”

What is Artificial Intelligence and Machine Learning?

- **Using computers to solve problems or make automated decisions, for tasks that when done by humans require a high degree of intelligence and a significant amount of time.**
 - The Human Capital it takes to compile manual worksheets at frequent intervals means the data is often stale
 - The inherent error rate with the complex data sets is high
- **Gain Rapid Cognitive Insight and Identify Patterns**
 - Apply patterns to vast volumes of data and interpret their meaning. It’s “Analytics on Steroids”
 - Pattern recognition identifies and predicts the smallest of hidden data & makes useful suggestions.
 - It makes suitable predictions using learning techniques.
- **Pattern Based AI can Continuously Learn, Predict and Adapt**
 - Computers solving problems by detecting useful patterns that would be complex to detect manually.
 - Use for both prediction and automation
 - Learning is Adaptive Example: “Train your Dragon” (Speech Recognition)

Deploying Artificial Intelligence (AI)

Providing People with Tools Needed to Solve Previously Unsolvable Business Issues

Advanced analytics and the use of artificial intelligence have been used for several years by industries to assist them in achieving huge successes.

The Use of AI, has given companies a Competitive Edge

- Entertainment streaming – *Netflix*
- Retail – *Amazon*
- Wallstreet - Stock market algorithms –automatic buy and sell
- Ride share companies - *Uber*
- Email Spam Filters, Social Media, Targeted Marketing

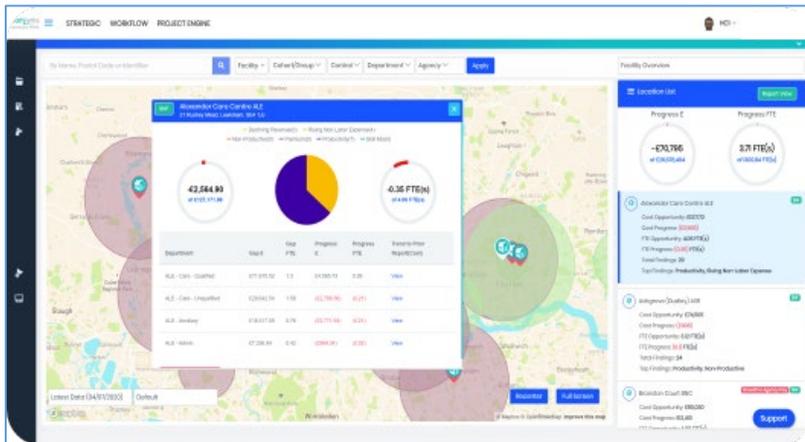
You can't take the people out of healthcare. But, healthcare has gotten in on this on the clinical side with technology such as IBM Watson Imaging Patient Synopsis

- Digital Consults
- Medication Management
- Radiology Diagnosis

How Can Leaders Use Artificial Intelligence and Machine Learning for Healthcare Operations?

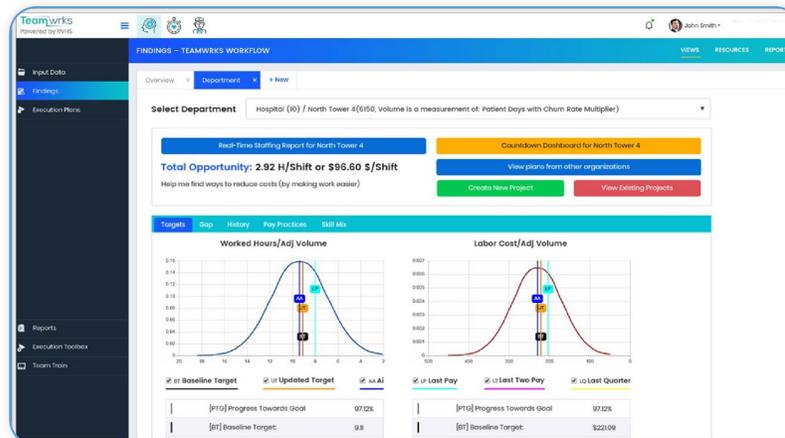
To empower health organizations and change leaders to significantly improve financial and quality performance without attacking staff.

- This means reducing operational costs, including labor usage, non-labor expense, clinical or operational variation, predictive staff modeling, demand matching, capacity planning and scenario planning



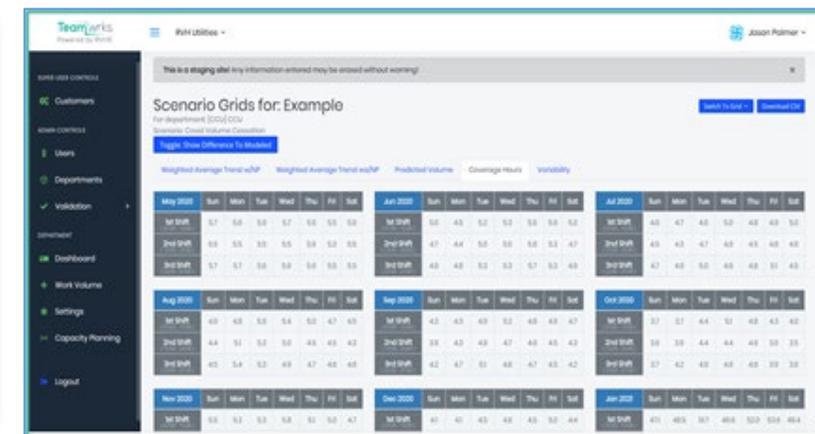
Provides Rapid, Remote Full System Situational Awareness

Allow Change Leaders to Pinpoint Amplitude of Need and Focus Resources on the Areas of Greatest Need at all Times



Offers Unprecedented Level of Granular Workforce Insights

Rapidly and Remotely Identify the Patterns that are driving opportunities at the facility, department and staff level



Provides Predictive Staff Modeling & Demand Matching

Allow Leaders to predict volume swings and staffing needs months in advance to assure quality and proper staff utilization

**Productivity = Valuable
output / Time and
resource inputs**

**Deploying Artificial
Intelligence (AI)
enabled technology to
improve productivity,
financial performance
and quality**

Basic Productivity = Output / Input

Defining Productivity in Financial Terms means the output you get per input given.

For example, if I can get 1 liter of Apple Juice out of 5 Apples and you can do it with 4, you are more productive.

That's the basic business, or economic, definition of productivity. Improving productivity in the business sense means either a) increasing output relative to input or b) decreasing input relative to output.

It does not account for quality and other non-financial metrics.

The key is improving productivity WITHOUT harming people or outcomes. AI can provide bandwidth and tools to accomplish this.

Simple Steps to Ensure Powerful Results

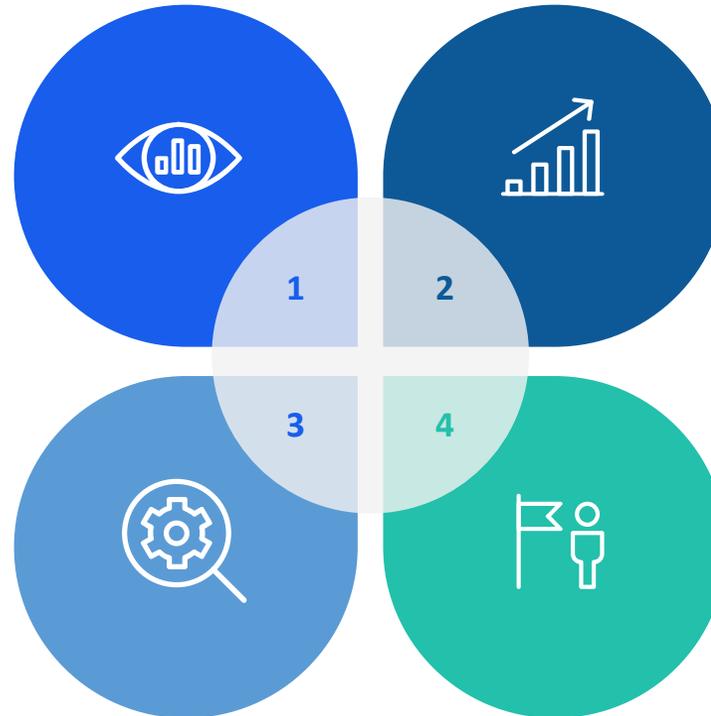
Driving Frictionless Improvements

1) IDENTIFY GAPS AND PRESENT OBTAINABLE, ACTIONABLE TARGETS

We identify opportunity gaps by using internally validated data to find inarguable opportunity gaps.

3) MAP TO APPROPRIATE PROJECTS

Our technology identifies projects and enables your leaders and change experts to distribute work and focus on higher impact projects while empowering broader staff to identify, execute and sustain change.



2) DRIVE SEAMLESSLY TO ROOT CAUSE/PATTERNS

Our technology rapidly analyzes root cause and shares insights to help realize value from the data.

4) COMPETANCY TRANSFER, REPORTING & SUSTAINABILITY

We provide a common language & structure for internal process improvement teams and health systems to allow for distribution, celebration and oversight of best practices based on your vision.

(1) Establishing Operationally Achievable Targets

Measuring You Against You

The Challenge of External “Aspirational” Benchmarks and the Importance of Internal Targets

“*Aspirational productivity*”: how do we go beyond our historical capacity and/or replicate what other organizations are doing

- **Relies on External Benchmarks**, typically survey’s of “like” organizations and cohorts

“*Operational productivity*”: how we do what we already do more efficiently with less variability or with high-reliability

- Uses Internal Data with **Operationally Achievable Targets** and Internally Validated Benchmarks

(1) Establishing Operationally Achievable Targets

**Understand That All
Hospitals are Different**

Challenges with Traditional Measures of Productivity?

Measuring solely against an external benchmark (aspirational productivity), creates friction and reduces the likelihood of buy-in.

“Our patients are different, sicker, more economically challenged...”

“Our workflows, EHR, policies, practices are different, more complex, challenging...”

“You are comparing us to a larger institution with more resources/a smaller institution that’s more nimble...”

“Our supplies closets are further away from the bed...”

“We are different....”

(1) Establishing Operationally Achievable Targets

**Monitors high reliability
(low variability) and
ID's the trends that get
in the way of work**

Why Focus on Operational Productivity?

Operational Productivity is a measurement of variation, which is also a measure high reliability. According to the Joint Commission, High Reliability means consistent excellence in quality and safety across all services maintained over long periods of time.

You simply cannot measure high reliability with an external benchmark because **you cannot reduce unnecessary variation without being able to first identify the sources of variation.**

By utilizing internal data, AI is able to constantly monitor variation, remove confounding variables, and focus on the underlying internal workflows that create a barrier to high reliability.

**How we do what we already do more efficiently with
less variability?**

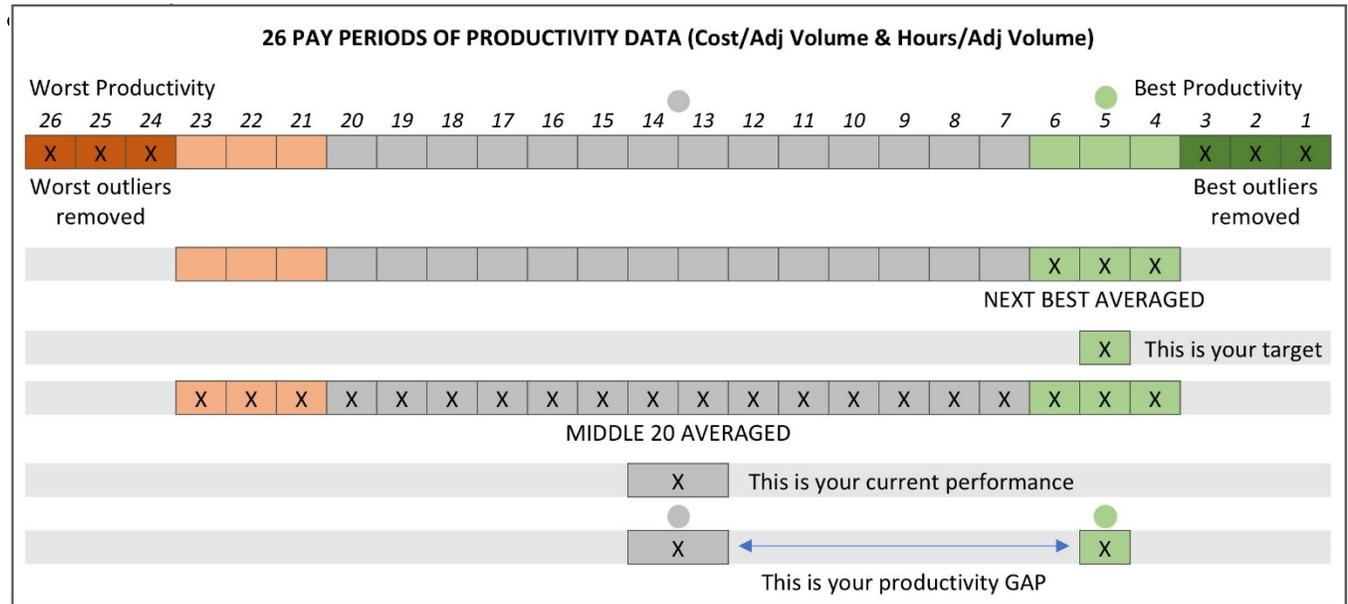
(1) Establishing Operationally Achievable Targets

Deploying Artificial Intelligence (AI) enabled technology to improve productivity, financial performance and quality

How to Begin – Productivity

Compare volume to:

- Labor (Cost and Hours)- Accounting for Productive and Non-Productive Time
- Non-Labor Expense
- Revenue



Note: AI's Internal Targets Also Drive The Engine Of Continuous Improvement Since You Are Never As Good As Your 5th Best

(2) Performing Root Cause for Rapid Pattern Identification

Deploying Artificial Intelligence (AI) enabled technology to improve productivity, financial performance and quality

So far we only have half the story....

Trending to a gap, shows us **when** we have not hit the target, but it doesn't show the **WHY or the WHAT?**

- Why did we not hit our goal or target?
- What can we do to correct?

Think of it as similar to your fitness goals, did you not hit the target because your calories were too high, your eating habits erratic or you did not exercise enough?

Changes can be subtle and difficult to monitor without constant support but have significant impacts on results.

How can you get back on track? What projects can help you change the patterns? An Eating or Exercise Plan tied to your specific needs.

(2) Performing Root Cause for Rapid Pattern Identification

Measuring against one target isn't enough. You need to know why in order to identify the solution.

Benefit of Operational Productivity - Turning Data into Insights

By studying variation in your performance, you can track and trend patterns that are at the root cause of the variation.

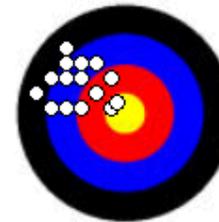
Can you tell how consistently you are meeting your target or are you just averaging out?

Measuring against only one target doesn't provide enough data to identify patterns that contribute to the root or underlying issues that impact your performance.

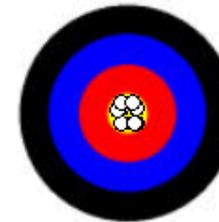
Reduce Spread



Adjust Target



Precision



Using your own data also allows for more reliable forecasting, providing forward looking insightful information about future trends in volume, revenue, expenses, staffing needs etc.

(2) Performing Root Cause for Rapid Pattern Identification

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Deploy AI to Look for Common Patterns Such as:

- Forced or Reversed Productivity
- High Sustained Variability
- Declining Productivity
- Rising Premium Pay
- Seasonal Volume Swings
- Rising or Non-Evenly Distributed Non-Productive Pay (which often causes rising labor costs)
- Skill Mix Flexing Patterns
- Growth in Call Back Pay
- Call and Call Back Pay not in Alignment

(2) Performing Root Cause for Rapid Pattern Identification

Measuring against one target isn't enough. You need to know why in order to identify the solution.

Example of Data used in a single initial analysis to produce visual output for a single chart for a single department in the Productivity platform (the platform produces 16 unique visual analytics outputs per department):

26 pay periods of labor (adjusted for non-productive & exempt staffing)

26 pay periods of work volume (adjusted for local conditions)

Classification/taxonomy applied:

Pay codes and pay-types are grouped into 12-14 cohorts

Job codes are grouped by like

Pay codes are grouped into Productive & Non-Productive

Departments are grouped into 23 unique types (patterns & plans vary by department type)

Calculations to create a single visual output (1 of 16) for a single department (IVB analysis)

Adjusted volume/adjusted labor calculated for each period

Top and bottom outliers scrubbed

Average value calculated

Target calculated as 2nd tier cohort (cohort directly beneath high-performance outliers)

Gap plotted on chart as Delta % from target of worked hours/adjusted volume (see gap chart below)

Gap against target calculated for each period

3 period moving average calculated and plotted (the black line)

Pattern identification algorithms are applied and have been written to identify unique (often interdependent) condition states between trends in the visual outputs of the 16 analytics sets. Some of these condition states are laboriously complex as they rely on a multi-variant analysis of the 16 meta analytics outputs to identify which of the 26 patterns exist.

Sample pattern identification algorithm (of 26 in this toolset) utilizing the example below:

IF: rise/run of most recent 26 periods of the 3-month moving average of gap in delta against target of wh/av when adjusted for outliers (worked hours/adjusted volume) > x threshold, then pattern match is positive for High sustained productivity variability.

(2) Performing Root Cause for Rapid Pattern Identification

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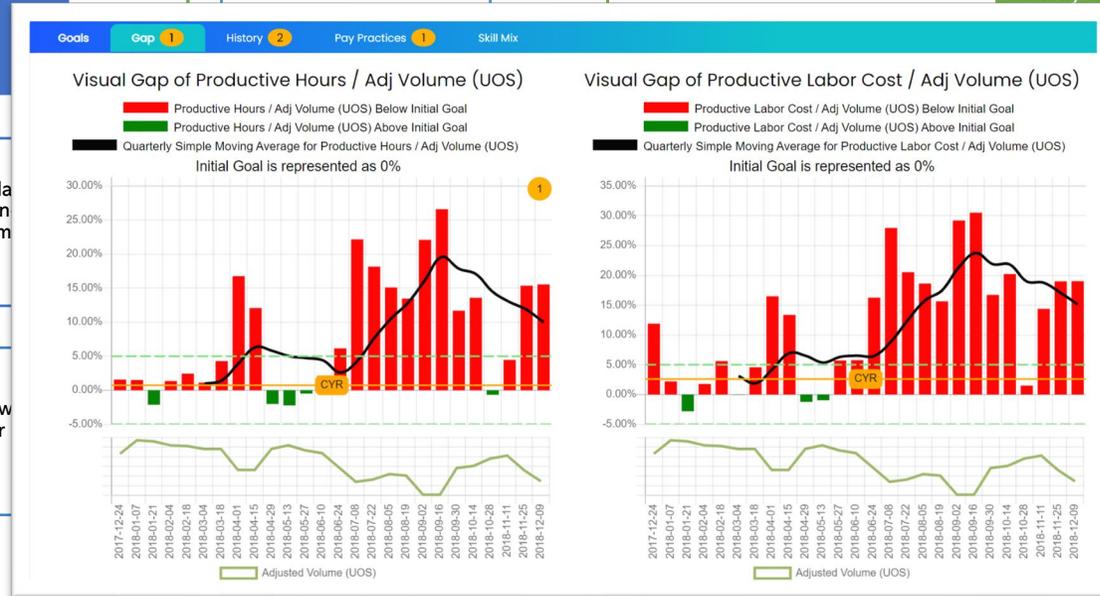
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Sample pattern identification algorithm (of this toolset) utilizing the example below

Use/run of most recent periods of the 3-month moving average of gap in delta against target of wh/av when adjusted for outliers (worked hours/adjusted volume) > .005, pattern match is positive for High sustained productivity variability.

Gap against target calculated for each period

3 period moving average calculated and plotted (the black line)

(2) Performing Root Cause for Rapid Pattern Identification

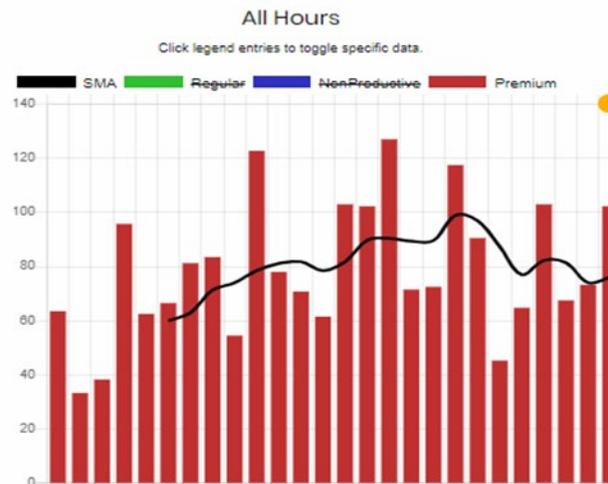
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Deploy AI to Look for Common Patterns Such as:

- Forced or Reversed Productivity
- High Sustained Variability
- Declining Productivity
- **Rising Premium Pay**
- Seasonal Volume Swings
- Rising or Non-Evenly Distributed Non-Productive Pay (which often causes rising labor costs)
- Skill Mix Flexing Patterns
- Growth in Call Back Pay
- Call and Call Back Pay not in Alignment

Overuse of Premium Pay During Low Census Periods

When Premium Pay hours have been utilized in the same period as many "low census staffing" reductions then there may exist opportunities to re-design policies/procedures to ensure that the organization is not "paying people not to work" in the same period that they are paying other people "premium pay" for coverage.



(2) Performing Root Cause for Rapid Pattern Identification

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A cohort's staffing no longer matches to reported volumes for category RN/LPN

One of your cohorts (types of staff) has been working in a pattern contrary to changes in reported volume. This could be due to one of the following reasons:

1. Their work has nothing to do with the volumes being reported (consider removing them from the analysis or separating them into their own dept with unique volumes).
2. Your volume measure needs to be updated to reflect their actual work.
3. For some reason, staffing for this cohort is not aligning with volumes and a strategy needs to be developed to remediate.

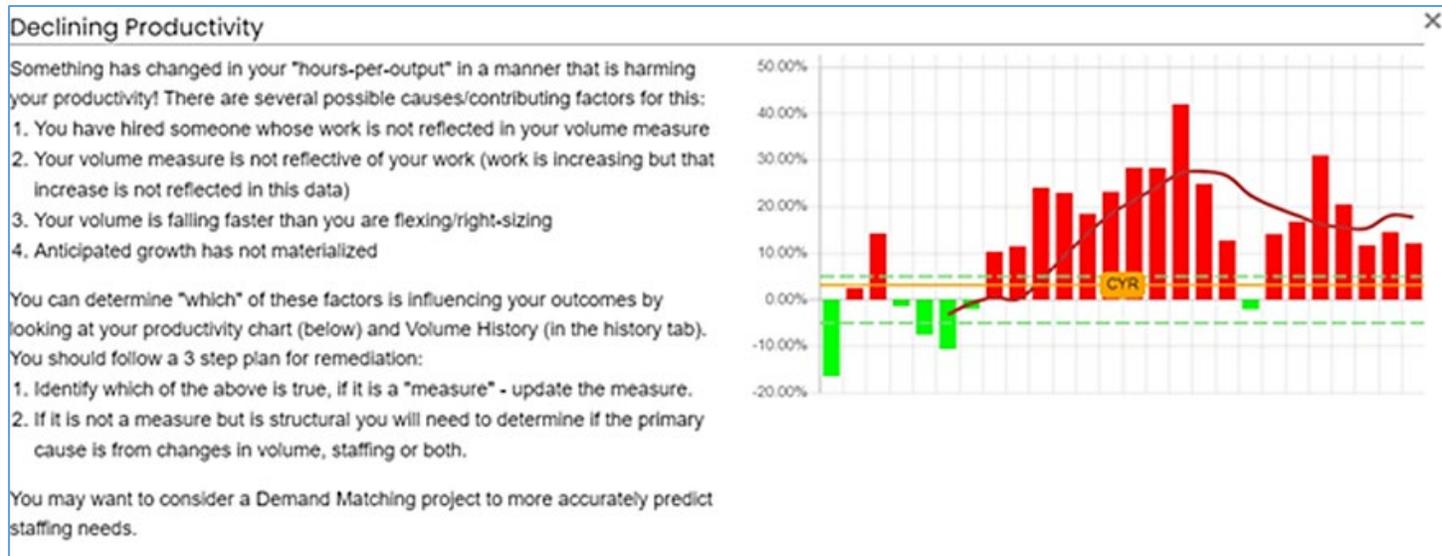


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(2) Performing Root Cause for Rapid Pattern Identification

Rapid Discrete Pattern Identification Across Every Department

Performance Comparisons						
Department Performance Comparisons						
Show 5 entries Print Export CSV Column Visibility Search: <input type="text"/>						
Department (Facility ID / Dept ID)	Measures / Adj Volume	Per-Shift* OAT Productivity Gap	Annual* OAT Productivity Gap	OAT Progress Toward Goal	Finding Count	Finding Details
ACADEMIC (10 / 10341) Performance Report	Worked Hours	8.02 hrs	5,851.02 hrs	20.37%	4	<ul style="list-style-type: none"> ➤ Growth in Orientation / Training Pay ➤ A cohort's staffing no longer matches to reported volumes for category FINANCIAL COUNSELOR 1 ➤ High Sustained Variability ➤ Rising Non-productive utilization ➤ Rising use of Premium Pay ➤ Growth in PTO / Sick / Leave Pay
	Labor Cost	\$149.61	\$109,217.98	68.75%		
ADMINISTRATION (10 / 10820) Performance Report	Worked Hours	1.42 hrs	1,033.47 hrs	-333.94%	5	<ul style="list-style-type: none"> ➤ A cohort's staffing no longer matches to reported volumes for category Other ➤ High Sustained Variability ➤ Declining Productivity ➤ Rising Non-productive utilization ➤ Growth in Orientation / Training Pay
	Labor Cost	\$45.41	\$33,148.67	28.38%		
ANESTHESIOLOGY-SURGERY (10 / 10323) Performance Report	Worked Hours	4 hrs	2,918.08 hrs	35.14%	6	<ul style="list-style-type: none"> ➤ Forced/Reversed Productivity ➤ High Sustained Variability ➤ Rising Non-productive utilization ➤ Growth in Call-Back Pay ➤ Growth in Over-Time Pay ➤ Growth in PTO / Sick / Leave Pay
	Labor Cost	\$67.20	\$49,052.82	49.56%		
BLOOD SERVICE (10 / 10425) Performance Report	Worked Hours	1.89 hrs	1,377.66 hrs	-50.43%	2	<ul style="list-style-type: none"> ➤ High Sustained Variability ➤ Growth in Orientation / Training Pay ➤ Forced/Reversed Productivity
	Labor Cost	\$76.65	\$55,951.14	-80.16%		
C-T SCAN (10 / 10542) Performance Report	Worked Hours	2.02 hrs	1,476.38 hrs	-45.97%	3	<ul style="list-style-type: none"> ➤ Forced/Reversed Productivity ➤ Growth in Over-Time Pay ➤ Growth in PTO / Sick / Leave Pay
	Labor Cost	\$85.28	\$62,252.01	-17.61%		

Showing 1 to 5 of 66 entries

Previous 1 2 3 4 5 ... 14 Next

(3) Mapping to Appropriate Projects

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Each Pattern Can Be Automatically Mapped to Projects:

AI and Machine Learning can constantly map patterns to a set of projects and track outcomes to further refine the process:

The screenshot displays a software interface for project management. At the top, a title bar reads "Overuse of Premium Pay During Low Census Periods". Below this, there are three tabs: "Findings", "Project Options", and "Generated Plan".

The "Project Options" tab is active, showing a "Plan Description" table with the following entries:

Plan Description	Generate
Push reports of real-time staffing to better monitor staffing vs. volume	Generate
Review current volume measures to ensure they are reflective of work for all cohorts (Split department/adjust measures as needed)	
Review policies/procedures for covering low-volume pay periods	

To the right of the table is a bar chart titled "Overuse of Premium Pay During Low Census Periods". The y-axis ranges from 600 to 1800. The chart shows several bars of varying heights, with the highest bar reaching approximately 1600.

The "Generated Plan" tab is also visible, showing a project titled "PUSH REPORTS OF REAL-TIME STAFFING TO BETTER MONITOR STAFFING VS. VOLUME" with the ID "60100 - ICU (10 / 60100-1)" and the role "Director".

Below the project title, there are buttons for "Add Plan to VEP" and "Print", and a "New Window" link.

The "Effort and Impact" section shows:

- Impact Category: Staffing & Scheduling
- Scope: Only this department
- Effort: Low
- Impact: High

The "SBAR Summary" section contains the following text:

- Situation:** The department has no simple way of identifying (with perfect precision) what the 'real-time' work burden on current staff is (volume vs. staffing with an effort/ability overlay). This results in 'best guess' staffing that may be impacting productivity (long term).
- Background:** The creation/sharing /sophistication of 'visible data available' about real-time-staffing work burden has not kept pace with the needs of managers to make real-time informed decisions on staffing.
- Assessment:** There is no single source that 'pushes' data about the current work-burden/workload of existing staff to allow for good planning, assigning or flexing.

Deploying Artificial Intelligence (AI) enabled technology to improve productivity, financial performance and quality

Utilize Artificial Intelligence and Machine Learning to Identify Patterns

A pattern can be defined as anything that follows a trend and exhibits some kind of regularity.

The recognition of patterns can be done physically, mathematically or using algorithms (a process or set of computational rules).

When we talk about pattern recognition in machine learning, it indicates the use of powerful algorithms for identifying the regularities in the given data.

Advantages

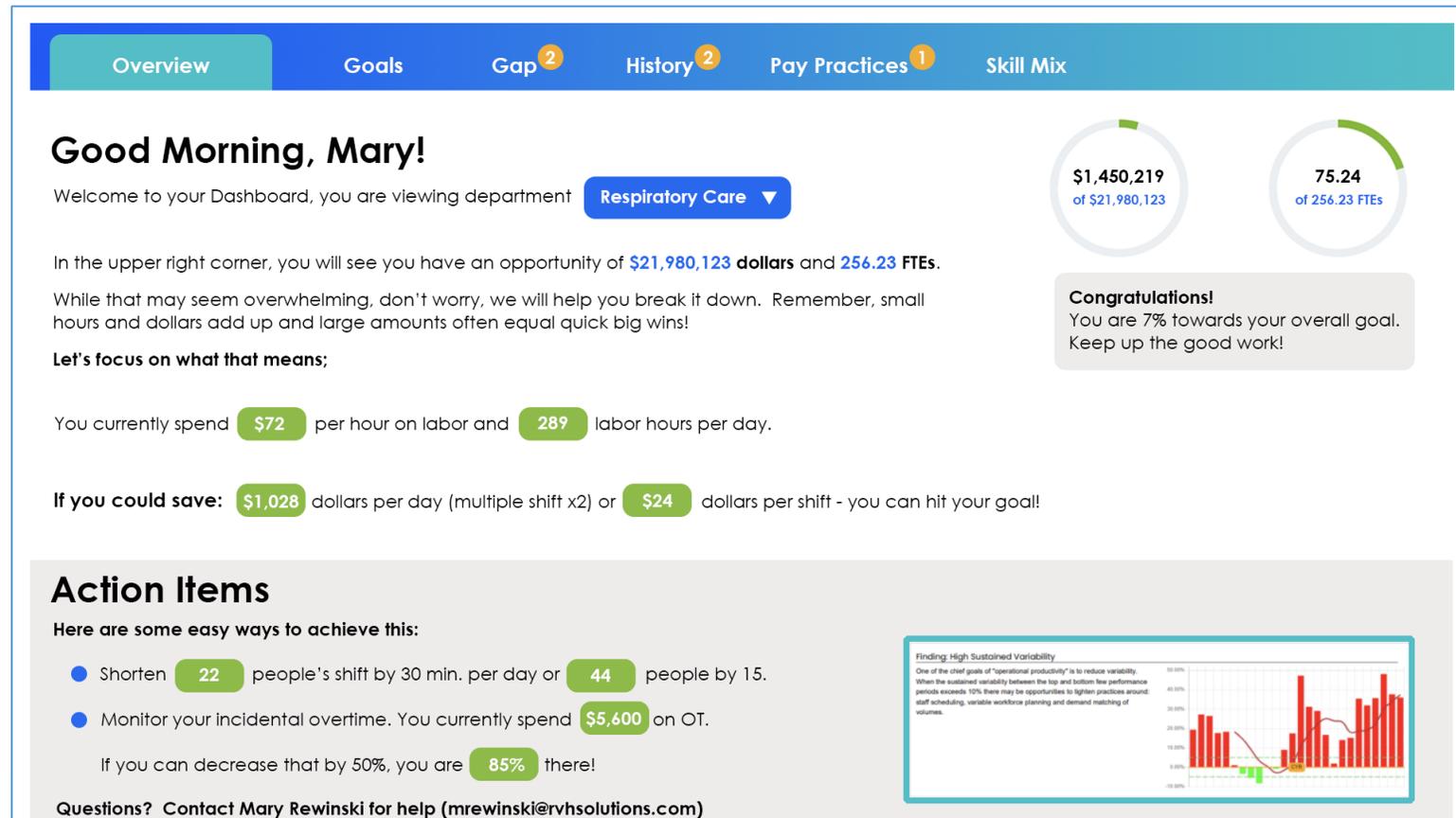
- It helps in the immediate identification of patterns at varying distances and angles that would require significant human capital.
- It can be highly automated.
- It can easily learn new patterns and monitor endless variations controlled by the leader.
- It can be made to be proactive (pushing notifications to leaders).
- It can be made to be easily translated so it is easily understood by staff to allow for distributed work.

(2) Performing Root Cause for Rapid Pattern Identification

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Utilize Artificial Intelligence and Machine Learning to Identify Patterns

It can be made to be easily understood by staff to allow for distributed work.



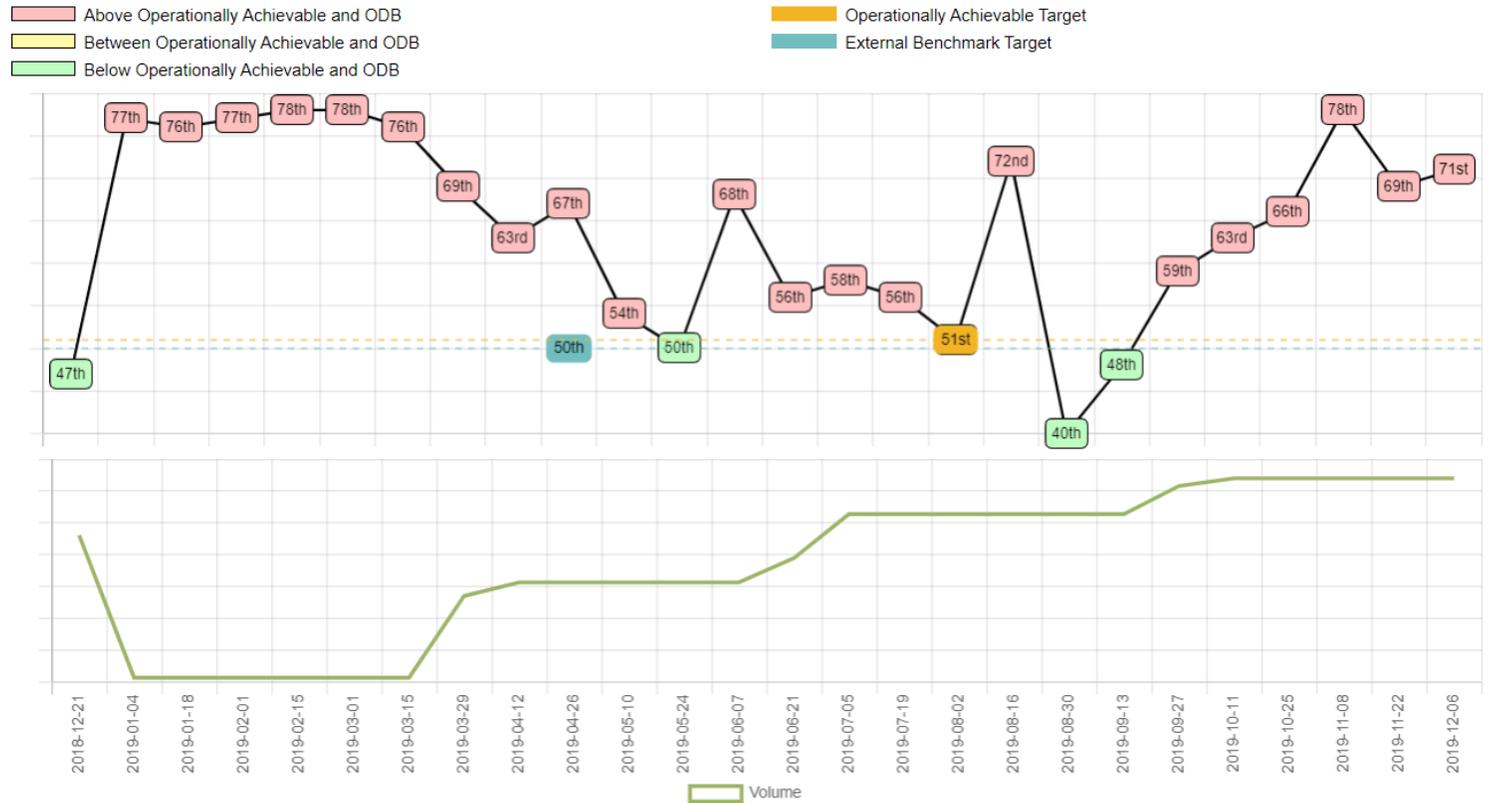
Note: There can be a marriage between Operational and Aspirational Productivity

Deploying Artificial Intelligence (AI) enabled technology to improve productivity, financial performance and quality

How to Begin – Productivity

After you calculate the gap, track and trend your progress over time, do this for each cost center/operational area

Target Analysis



(4) Rapid, Full-System Situational Awareness and Scalability

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GlobalIncidentMap.com A Global Display of Terrorism And Other Suspicious Events

The map displays a global distribution of incidents, with a high concentration in North America and Europe. Icons include yellow stars, blue arrows, green biohazard symbols, and orange bomb symbols. The map interface includes a compass, zoom controls, and a 'Show Labels' checkbox. A scale bar shows 1000 miles and 2000 kilometers. The bottom of the page features a login form and a grid of navigation buttons for various incident categories.

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The Incident Data On This Free Version Of The Map Is Time-Delayed 24 to 48 Hours - For Current Information Please Consider Subscribing

Login Name:
Password:
[I forgot my password...](#)

GlobalIncidentMap.com | Amber-Alert Map | HAZMAT Situations Map | Forest Fires Map | Disease Outbreaks Map
Gang Activity Map | Border Security Issues | Presidential Threat Map | Terrorism Event Predictions | New - Quakes Map
Drug Interdictions Map | Non-Terror Aviation Incidents | NEW - Food/Medicine Incidents | NEW - Human Trafficking

(4) Rapid, Full-System Situational Awareness and Scalability

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(4) Rapid, Full-System Situational Awareness: Rapid Remote Pattern Analysis

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The screenshot displays the TeamWrks dashboard interface. At the top, there are navigation tabs for 'STRATEGIC', 'WORKFLOW', and 'PROJECT ENGINE', along with a user profile 'Demo'. Below the navigation, there are several filter dropdowns: 'Facility', 'Cohort/Group', 'Control', 'Department Type', 'Pay Practice - Risi...', and 'Sub Pattern', followed by an 'Apply' button. A search bar is present with the placeholder text 'By Name, Postal Code or Identifier'. The main area is a map of the United States with various facility locations marked by icons. A dropdown menu is open over the map, listing various patterns such as 'Overuse of call during low census periods', 'Overuse of call', 'Rising OT', 'Rising Call', 'Rising CB', 'Rising incentive', 'Rising bonus', 'Rising use of Weekend Premium', 'Rising Use of Agency', and 'Rising use of one time pay'. To the right of the map, there is a 'Facility Overview' section with two progress indicators: 'Progress \$' showing '\$723,407 of \$176,754,104' and 'Progress FTE' showing '~29.11 FTE(s) of 2122.49 FTE(s)'. Below this, there is a 'Location List' section with a 'Report View' button. The list includes three entries: 'North Eastern Pennsylvania Health - RMC' (Hospital) with a cost opportunity of \$11,254,432 and 181.91 FTE opportunity; 'Hudson Valley Health Network - Long Term Care' (LTC) with a cost opportunity of \$337,503 and 3.4 FTE opportunity; and 'RVHS CAH 1' (Critical Access Hospital) with a cost opportunity of \$2,821,897 and 11 FTE opportunity. A 'Support' button is located at the bottom right of the dashboard.

(4) Rapid, Full-System Situational Awareness: Monitoring Adaptability

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The screenshot displays the Teamwrks dashboard interface, powered by RVHS, for Parker Hospital. The main view is a map of the Northeast United States with a facility selection overlay. The overlay lists various facility types, with 'Hospital' and 'Emergency Care' selected. A detailed popup for 'North Eastern Pennsylvania Health - BMC' shows a pie chart and a table of departmental performance metrics.

Facility Selection Overlay:

- Select all
- Hospital
- Primary Care
- Cancer Center
- Rehabilitation/ Physical Therapy
- Laboratory Services
- Emergency Care
- Health and Fitness Center
- Imaging Services
- Immediate Care
- Occupational Health
- Other
- Sleep Centers
- Outpatient Facilities

Facility Performance Popup (North Eastern Pennsylvania Health - BMC):

- Progress \$: -\$0 of \$11,254,432
- Progress FTE(s): -0 FTE(s) of 182 FTE(s)

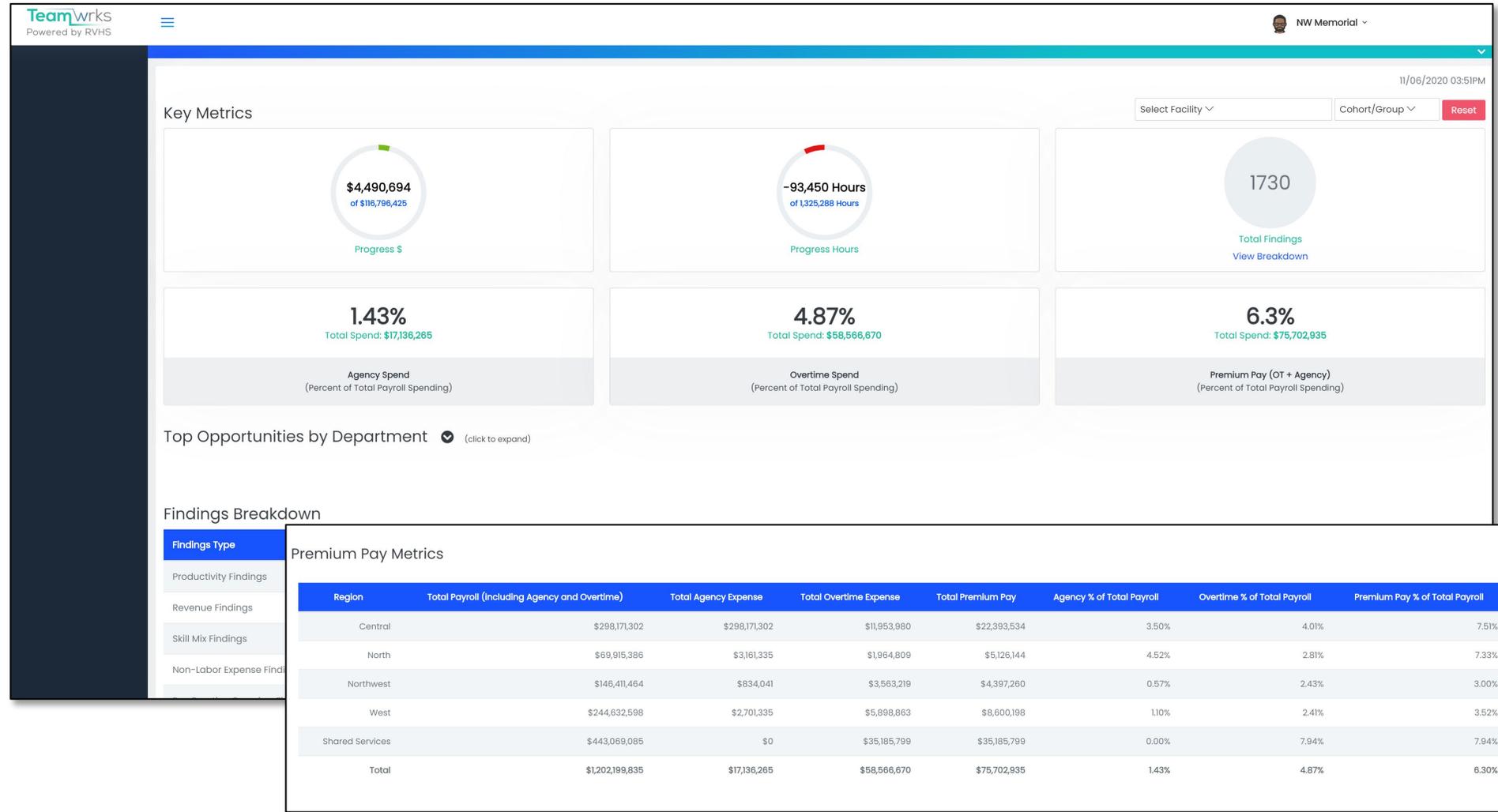
Top 5 Departments	Gap \$	Gap FTE	Progress \$	Progress FTE	Trend to Prior Report(Cost)
TRAUMA ACUTE (601000)	\$1,133,281.63	12	(\$0)	(0)	View
TRAUMA RESUS (620100)	\$670,156.35	11	(\$0)	(0)	View
ACUTE/OP THERAPY (740200)	\$644,959.69	8	(\$0)	(0)	View
EMERGENCY ROOM (620000)	\$644,858.04	12	(\$0)	(0)	View
MEDICINE ACUTE (600100)	\$309,954.22	7	(\$0)	(0)	View

Facility Overview Sidebar:

- Location List:** Clinical View
- Progress \$:** \$723,407 of \$176,754,104
- Progress FTE:** -29.11 FTE(s) of 2122.49 FTE(s)
- North Eastern Pennsylvania Health - RMC (Hospital):**
 - Cost Opportunity: \$11,254,432
 - Cost Progress: (\$0)
 - FTE Opportunity: 181.91 FTE(s)
 - FTE Progress: (0) FTE(s)
 - Total Patterns: 741
 - Top Patterns: Productivity, Premium
- Hudson Valley Health Network - Long Term Care (LTAC):**
 - Cost Opportunity: \$337,503
 - Cost Progress: (\$0)
 - FTE Opportunity: 3.4 FTE(s)
 - FTE Progress: (0) FTE(s)
 - Total Patterns: 6
 - Top Patterns: Productivity, Skill Mix
- RVHS CAH 1 (Critical Access Hospital):**
 - Cost Opportunity: \$2,821,897
 - Cost Progress: (\$0)
 - FTE Opportunity: 11 FTE(s)

(4) Rapid, Full-System Situational Awareness: Customized Meaningful Metrics

Choose which metrics are most important to your organization with drill down view of performance

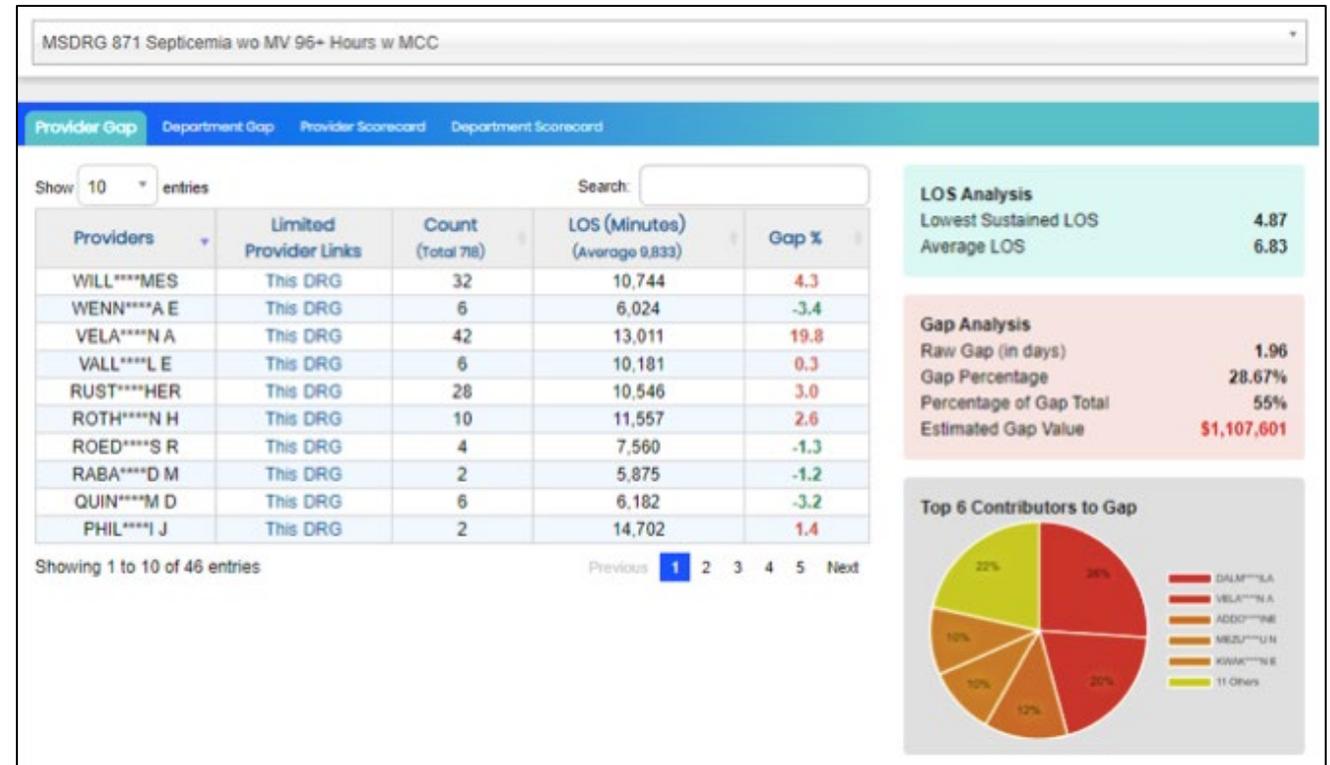


Applying to Clinical Variability and LOS

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Identify Root Causes for Clinical Variation:

- Perform an analysis by DRG to determine whether variability in LOS is more likely to have been caused by variability in provider practice/preference or by variability in department workflow



(3) Mapping to Appropriate Projects

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Benefit of Operational Productivity - Turning Insights into Solutions

Using advance analytics such as AI and Machine Learning allow you to identify and continuously track and trend Patterns that you can match to projects

Historical Data can predict future needs. With Demand Matching & Predictive Analytic tools you can use your historical data to predict things such as:

- Future Volumes
- Future Staffing Needs
- Future Resource Needs
- Patient Movement in Advance

Facilitating Demand Matching

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Utilize historical data to model forward in order to predict volumes for individual departments by DOW and month. The output allows you to identify seasonality and to determine rostering needs for the year, based off variation in volume and staffing ratios per position/per shift.

Forecasting/Predictive Analytics:

Demand Matching Tools create visibility to future volumes and staffing needs in a manner that accommodates distinctions by department in:

- Staff to workload synergy
- Staff to work volume (by shift)
- Budgetary requirements
- Department non-productive burdens

Uses:

- Annual Budgeting – variable workforce modeling
- Staffing – with flexing probability
- Scenario Planning – accounting for unpredictable volume or staffing changes

	Jun 2020							Jul 2020						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1st Shift <small>(07:00 - 19:00)</small>	→ 3	↓ 3	→ 3	→ 3	→ 3	↑ 3	→ 3	→ 2	→ 2	→ 2	→ 2	→ 2	→ 2	→ 2
2nd Shift <small>(19:00 - 07:00)</small>	→ 3	↓ 3	→ 3	→ 3	→ 3	→ 3	↓ 3	→ 2	→ 2	→ 2	→ 2	→ 2	→ 2	→ 2

FTE's			Sustained Variability
Total	FT	Variable	
25.6	20.6	5.0	19.4%

Scenario Planning

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Staffing Needs:

Staffing is not predicted but rather calculated based off the ratios entered by the user. The ratios can be edited and when updated and saved will recalculate the staffing requirements immediately.

Ratios can be entered by shift and you can also utilize a ratio calculator to show differences between ideal and “in practice” ratios.

Scenario Planning:

- Provider Vacation
- New Grad Hiring (NPL Changes)
- Unit Closure
- Staff Vacations
- Increase in Close Watch/Isolation

You can overlay multiple scenarios

Create Position
for department: [NE] NS (001 02 02)
for customer: Emerson (001 02-4)

Position Name/Label

Shift Length (in Hours)
Shift Length
8 hours (3 shifts/day)

Staff To Patient Ratios
You'll be able to assign staffing ratios after creating this position.

Copy Ratios From Another Position: (Optional)
 (Optional)
If you want to copy the ratios from another position as a starting point, select it here. Otherwise, leave this set to 'No Position Selected' to start fresh.

Ratio Calculator

Use different ratios for different volumes. Once the weighted ratio has been calculated and you click save, the final ratio is automatically entered into the page for you.

Ratio	% of Volumes
1 to 3	80 %
1 to 2	20 %

Results
Weighted Ratio: 1 to 2.8
Volume Included: 100%

Teamwrks
Powered by

Teamwrks

Powered by RVHS

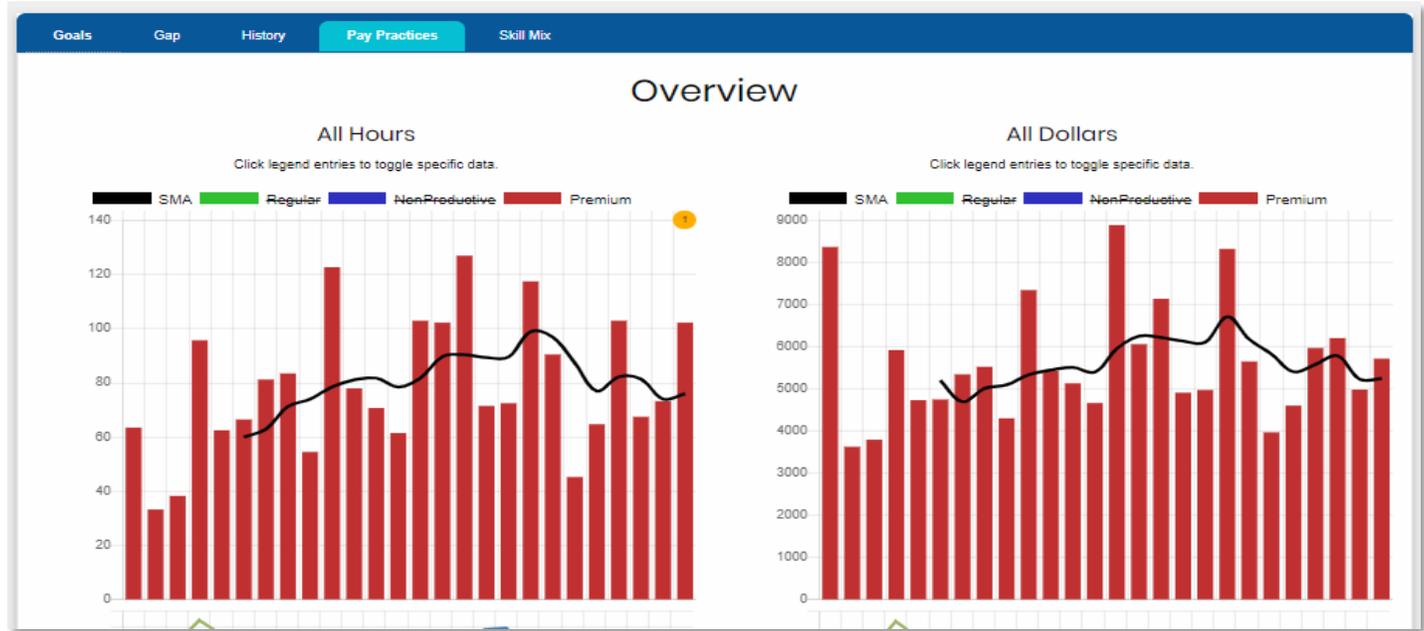
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Case Studies

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Data to Information

Rising Premium



A pattern that emerges when there is a significant increase in premium pay over multiple pay periods.

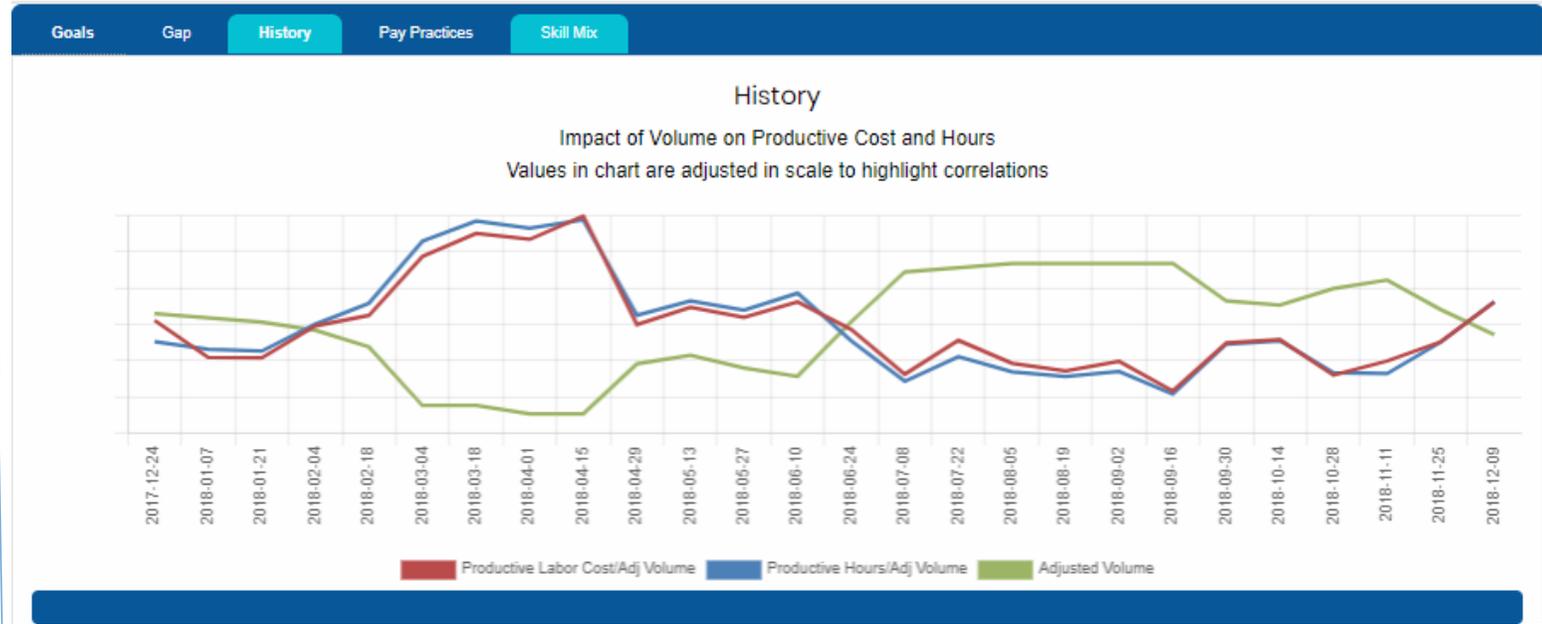
Case Study: Subtraction by Addition – Cutting Dollars with More Hours.

When analyzing an ED, we saw a rising pattern of premium pay. When investigated it was discovered that there was a long-term pattern of running with vacancies that were being filled by utilizing staff who had already reached their 40 hours in that week. By averaging the OT hours and the time of day/DOW utilization over the last year, it was determined that hiring 3 additional FTE's, as 6 PT positions could create a savings of 30%.

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Data to Information

Seasonal Variability



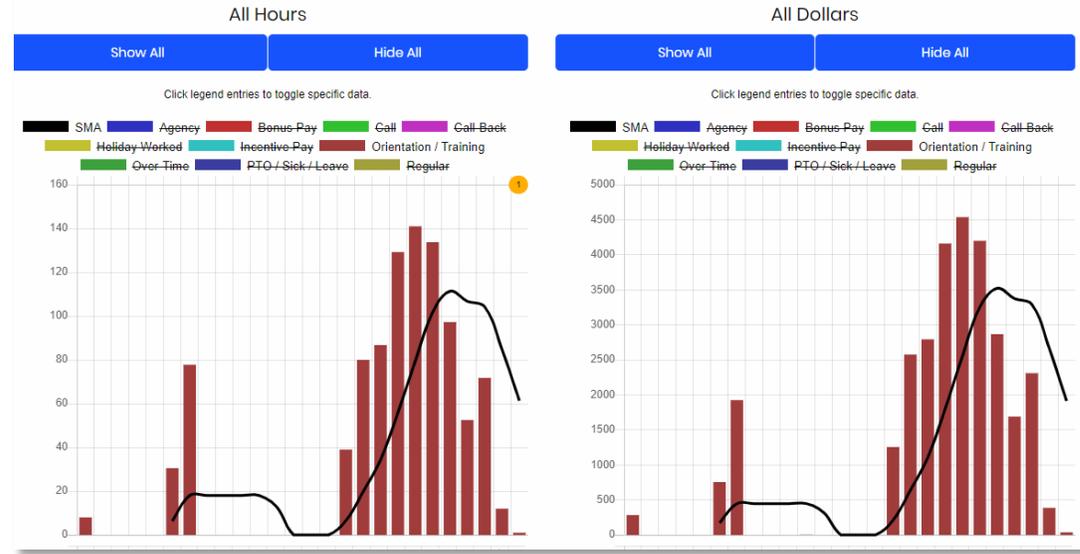
A pattern that emerges when there is a significant surge over consecutive months with a corresponding dip in volumes.

Case Study: Teacher Model - Utilize Demand Matching to Identify Seasonality and Staffing Demand Variations, Craft a Variable Workforce Strategy including the creation of a “Teacher Model” role for Respiratory Therapy for a client in the south that had very significant “bowl dips” during the summer months. This solution had a \$120k annual return.

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Data to Information

Rising or High Usage of Orientation By Category



A pattern that emerges when there is a significant increase or spend in Orientation Time

Case Study: When analyzing a nursing department we saw an unusually high cost for premium pay – close to \$300k per year. When investigated it was discovered that the department had high turnover and most positions were filled by new nursing grads, there was also an average of 4 vacancies on night shift an any given time, filled by OT. By changing the internal transfer policy for new grads from 6 months to 18 months, turnover was significantly decreased, reducing Orientation costs by \$200k and OT costs were decreased by \$39k.

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Data to Information

Rising Call Without Call Back



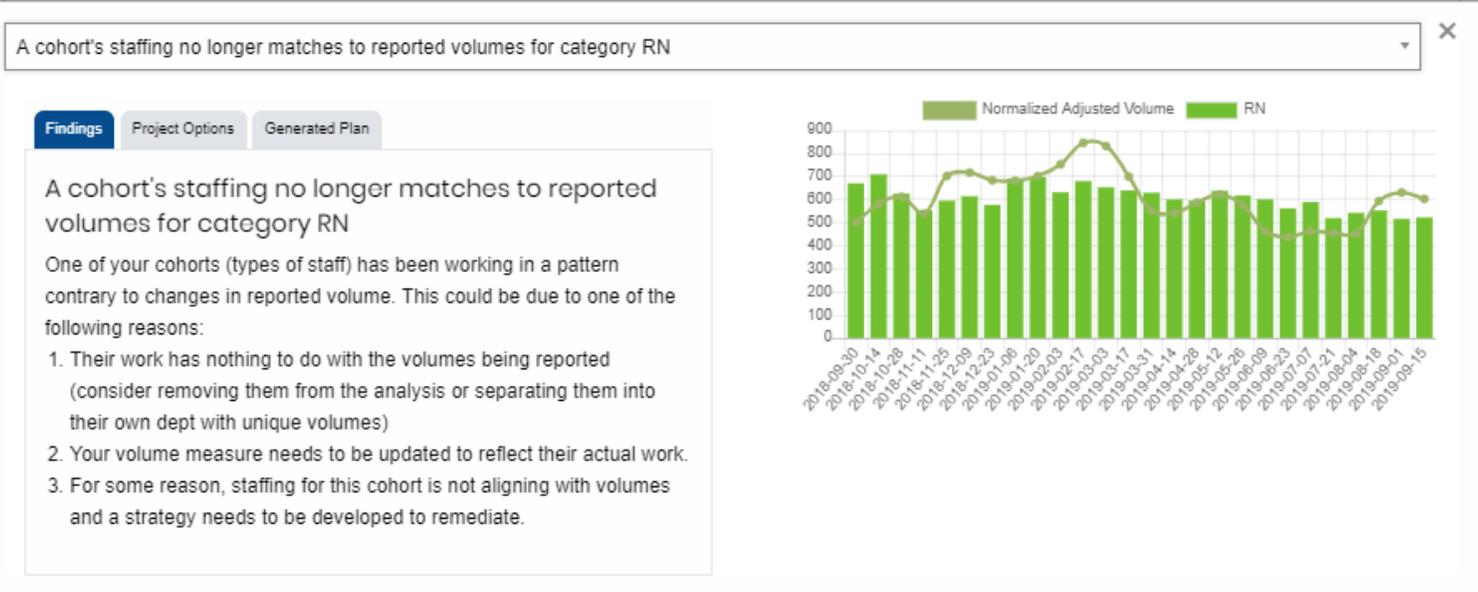
A pattern that emerges when there is a significant increase in call pay without use of call back.

Case Study: A client had a pattern of increasing call pay, when investigated it was determined that as census rose, they were not “calling back” the staff who were on call, but rather asking staff onsite to stay, resulting in OT. In addition the reason for the call was a defensive move in case staff were pulled from their unit. By restructuring the call schedules and addressing reasons for staff being pulled, the organization was able to save about \$1.1M in labor costs.

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Data to Information

Flexing Opportunities



A pattern that emerges when staffing patterns do not match volume fluctuations.

Case Study: Implement Demand Matching technology to forecast volumes and support the creation of a variable workforce pool, including implementing a “Super Tech” role for Security that previously required 3 separate roles to staff reducing their spend by \$100k. In addition, they identified a support opportunity for the “close watch” patients that reduced the organization’s nursing spend by \$250k+ while allowing the Security department to add staff.

THANK YOU

Thank You!

Jason Palmer, Bob Broadway

If you would like assistance working on improving care efficiencies, optimizing workflow and reducing labor expenses without cutting staff, please contact me for a free analysis of your organization.

Jason Palmer

CEO

RVH Solutions /Teamwrks

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