

Financial and Operational Benchmarking Using Automated Data Analytics

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- ▶ Analyzing Financial Information
 - Data Analytics/Analysis – Automation
- ▶ The Power of Budgeting/Forecasting
- ▶ Benchmarking
- ▶ Dashboards

Analyzing Financial Information

What is data analytics?

- It's the science and art of discovering and analyzing patterns, identifying anomalies, and extracting useful information in data through analysis, modeling, and visualization
 - It often involves analyzing more than high-level financial information and typically includes analyzing detailed transaction information
 - Can be performed using Excel but data analytics software tools are often helpful
- What is it used for? In addition to what flux and ratio analysis accomplish:
 - Detecting fraud, errors in data
 - Analyzing patterns and data for improving financial reporting processes
 - Monitoring employee, customer, and vendor activity

- ▶ One important way your organization analyzes its performance, its results, its successes is its **financial performance**.
 - It helps understand how the organization is doing
 - Is it trending in the right direction?
 - Is it meeting their financial and operational goals?
 - Is it meeting or exceeding expectations (budgets)?
 - Unusual trends may also indicate errors or even fraud in your financial information

- ▶ Common ways organizations can analyze their financial information to meet these objectives
 - ***Performing a year-over-year fluctuation (“flux”) or variance analysis***
 - Analyzing financial statement line information comparing current period vs. a comparable prior period (2020 sales vs. 2019, etc.) – **probably difficult when comparing to 2020 and even 2021 (i.e., pandemic)**
 - This is a vital tool and should be used on an ongoing basis
 - Can be used to compare current to immediately preceding period or multiple periods (for example, the years ended 2016, 2017, 2018, 2019 and 2020)
 - ***Performing a ratio analysis***
 - Analyzing certain financial statement ratios and comparing those ratios to prior periods/years

- ▶ Flux and ratio analysis – any tips before I start?
 - Like any good analysis, it's all about starting with good information
 - How many times have you heard the term “garbage-in, garbage-out”? Well, it applies here too!
 - Having consistent accounting policies applied on some accepted accounting basis (such as GAAP, cash basis, etc.) is important.
 - If you're working with compiled, reviewed or audited financial information, you likely have a great start
 - The stronger your accounting practices, policies and people, the more accurate and relevant your financial information is going to be

- ▶ Flux and ratio analysis – any tips before I start?
 - A classified balance sheet is best
 - Is revenue recognition reasonable and consistent?
 - Establish your **expectations**
 - You may determine that a certain \$ change and/or % change vs. a budget or prior year is within your expectation
 - For ratio analysis, as you will see, a % change or potentially some industry benchmark may be your expectation

Are you doing some sort of data analytics at your Organization?

- Yes and doing it well
- Yes but not well enough
- No
- Don't know

■ Example Variance Analysis – Income Statement (P&L)

		2021	2020	\$ change	% change
Operating revenue:					
	Program services	\$ 13,859,748	\$ 9,548,746	4,311,002	45%
Operating expenses:					
	Program services	13,658,742	9,648,759	4,009,983	42%
	Operating income (loss)	201,006	(100,013)	1%	-1%
Other income		958,211	1,345,871	(387,660)	-29%
	Net income	\$ 1,159,217	\$ 1,245,858	8%	13%

ANALYSIS

Operating income (loss)– 2020 a down year due to closures related to COVID-19? How is GP% (margin)?

Other income– Does the decrease make sense?

Where is the budget or expected performance?

► Ratio analysis –

- A variance analysis is a great place to start but a ratio analysis will provide even further insight into financial trends of your organization
- Ratios can be compared period-over-period similar to a variance analysis to see patterns or changes in ratios over time that could be positive, negative, or neutral
- Ratios also lend themselves well to benchmarking:
 - Depending on your organization or industry, benchmarking information is likely available that can help show how your organization compares to other similar organizations.
- Ratios can be analyzed in raw number format or using graphs, tables, charts – “visualizing” the trends is often very helpful
- Be mindful that a small change in ratio could be more significant than it looks

Top 10 key financial metrics or KPIs to track

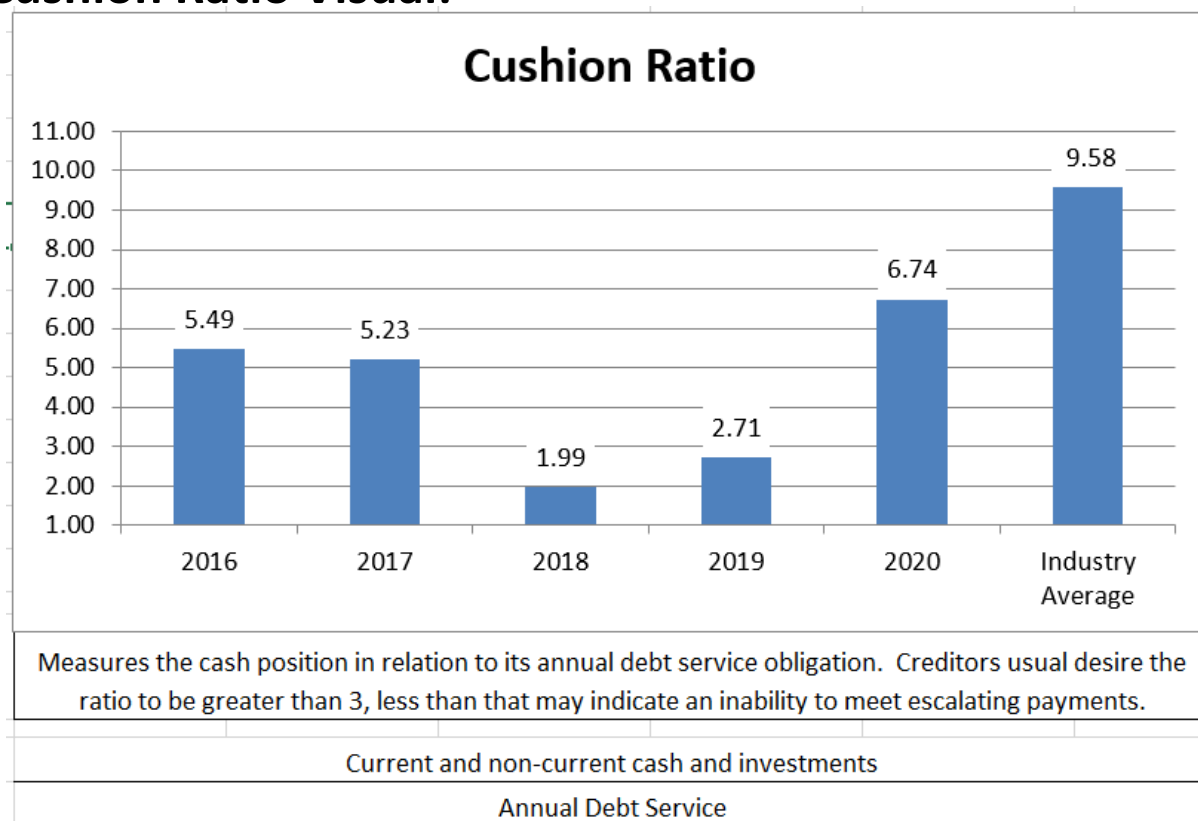
1. **Gross Profit Margin** – GP as a % of total net sales/revenues (great for benchmarking)
2. **Net Profit Margin** – includes most expenses including interest/taxes (less useful for benchmarking)
3. **Current Ratio** – provides information on solvency (good for benchmarking)
4. **Cushion Ratio** – provides available cash/investments to cover debt service in years (very useful for variance analysis)
5. **AR Turnover or Days in AR** – rate of collections over a period of time (great with variance analysis and benchmarking)

Top 10 key financial metrics or KPIs to track (cont.)

6. **Bonus and Shift Differentials** – the current labor market is almost forcing the use of these and costs can quickly escalate
7. **Hours per Resident Day of key labor departments** – Employee costs are normally majority of costs of an organization (good for variance analysis and benchmarking)
8. **Overtime Usage** – Payroll costs are a major factor
9. **Contracted Services Usage** – with labor shortages contracting can quickly become a huge expense
10. **Dietary Food Cost** – with current inflation trends, food costs are being impacted

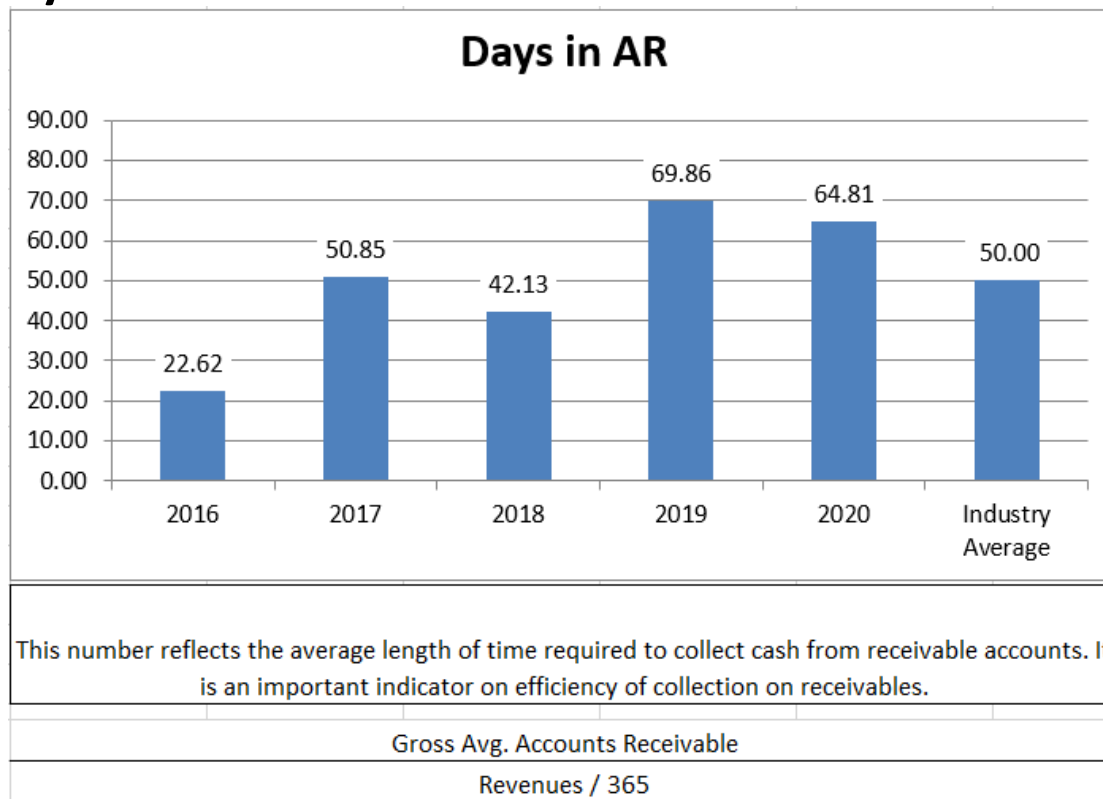
Ratio Analysis – Visualization with Bar Graph

■ Cushion Ratio Visual:



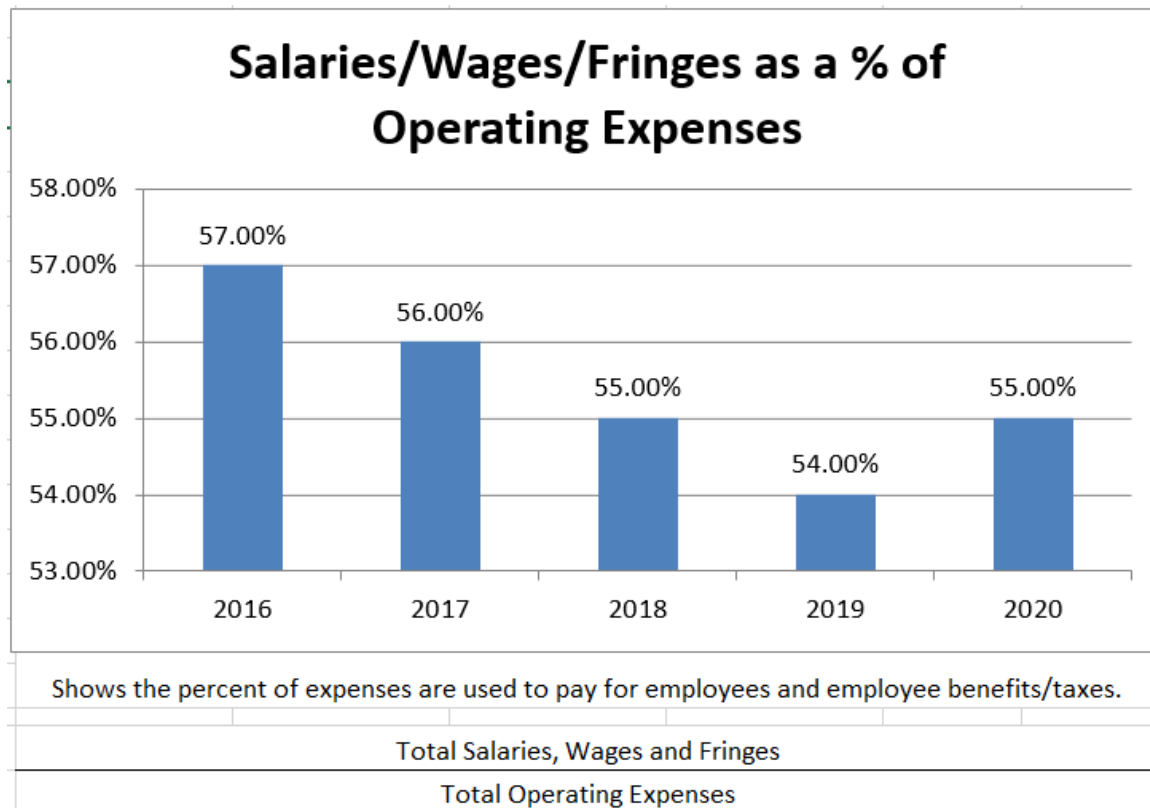
Ratio Analysis – Visualization with Bar Graph

■ Days in AR Visual:



Ratio Analysis – Visualization with Bar Graph

■ Salaries and related Visual:



Liquidity Ratios

Ratio	Formula	Interpretation
Quick Ratio	$\frac{\text{Cash \& Case Equivalents} + \text{short-term Investments} + \text{Receivables, net}}{\text{Current Liabilities}}$	The extent to which the more liquid assets are available to satisfy current liabilities. A quick ratio of 1.0 is considered liquid.
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liability}}$	The extent to which current assets are available to satisfy current liabilities. A current ratio of 1.0 means assets = liabilities.
Working Capital Turnover	$\frac{\text{Revenue}}{\text{Working Capital}} \\ (\text{Current Assets} - \text{Current Liabilities})$	The amount of revenue being supported by each \$1 of net working capital employed. Ratio >30 may indicate need for increased capital.
Days of Cash	$\frac{(\text{Cash \& Cash Equivalents}) \times 360}{\text{Revenue}}$	Number of days revenue in cash. Ratio of 7 days or more is considered adequate.
Days in Accounts Receivable	$\frac{\text{Accounts Receivable, net} \times 360}{\text{Revenue}}$	# of days to collect A/R. Lower ratio = faster collection = more liquidity.
Days in Accounts Payable	$\frac{\text{Accounts Payable} \times 360}{\text{Cost of Sales}}$	# of days to liquidate trade payables. Ratio should be compared to credit terms of vendors.

Leverage Ratios

Ratio	Formula	Interpretation
Fixed Asset Ratio	$\frac{\text{Net Fixed Assets}}{\text{Total Net Worth}}$	Level of stockholders' equity invested in net fixed assets.
Interest Bearing Debt to Net Worth	$\frac{\text{Interest Bearing Debt}}{\text{Net Worth}}$	Relationship between creditors and owners.
Debt to Equity	$\frac{\text{Total Liabilities}}{\text{Total Net Worth}}$	Relationship between creditors and owners.
Revenue to Equity	$\frac{\text{Revenue}}{\text{Total Net Worth}}$	Level of revenue supported by each \$1 of equity.
Equity to General & Administrative Expenses	$\frac{\text{Total Net Worth}}{\text{Gen. \& Administrative Exp.}}$	Level of overhead in relation to net worth.
Underbillings to Equity	$\frac{\text{Unbilled Work + Cost in Excess}}{\text{Total Net Worth}}$	Level of contract volume financed by the stockholders.
Cash to Overbilling	$\frac{\text{Cash}}{\text{Billings} > \text{Costs \& Gross Profits}}$	Relationship of cash to overbilling on contracts.

Profitability Ratios

Ratio	Formula	Interpretation
Return on Assets	$\frac{\text{Net Earnings}}{\text{Total Assets}}$	Profit generated by the total assets employed. Higher ratio=more effective use of company assets.
Return on Equity	$\frac{\text{Net Earnings}}{\text{Total Net Worth}}$	Profit generated by the net assets employed. Stockholders' return on investment.
Times Interest Earned	$\frac{\text{Net Earnings} + \text{Income Taxes} + \text{Interest Expense}}{\text{Interest Expense}}$	Company's ability to meet interest expense from operations. Low ratio may indicate an over-leveraged situation and need for more equity.

Do you use most of these financial metrics currently in your business?

- Yes for the most part
- Yes but may add a few more
- No
- Don't know

Automated Data Analysis

Account/Data Analysis and Mining

- ▶ Utilize data analysis software (electronic and 100% validity)
 - Risk scoring of transactions
 - Train employees how to use it to its full extent
 - Have audit/accounting firm complete periodic data analysis, not just at year end
 - Ensure employees know this is being done

Benford's Law

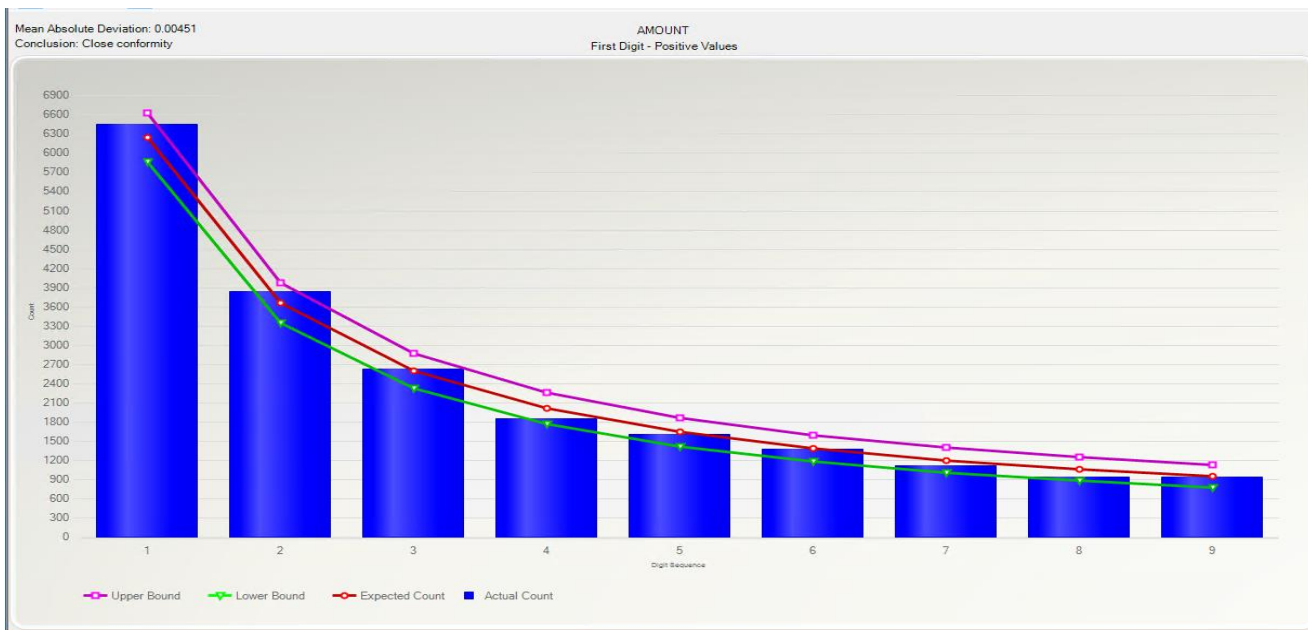
Benford's Law is a theory regarding the distribution of the first digits of large data sets. Many, but not all, large data sets conform to this theory. According to Benford's law, a general distribution occurs regarding the leading digits in a given data set.

- Can be used to detect fraud
- According to Benford's law, in a given population (say, **cash disbursement transaction amounts** for an a fiscal year), the distribution of the first number in each transaction amount will typically follow the pattern to the right:

d	$P(d)$	Relative size of $P(d)$
1	30.1%	
2	17.6%	
3	12.5%	
4	9.7%	
5	7.9%	
6	6.7%	
7	5.8%	
8	5.1%	
9	4.6%	

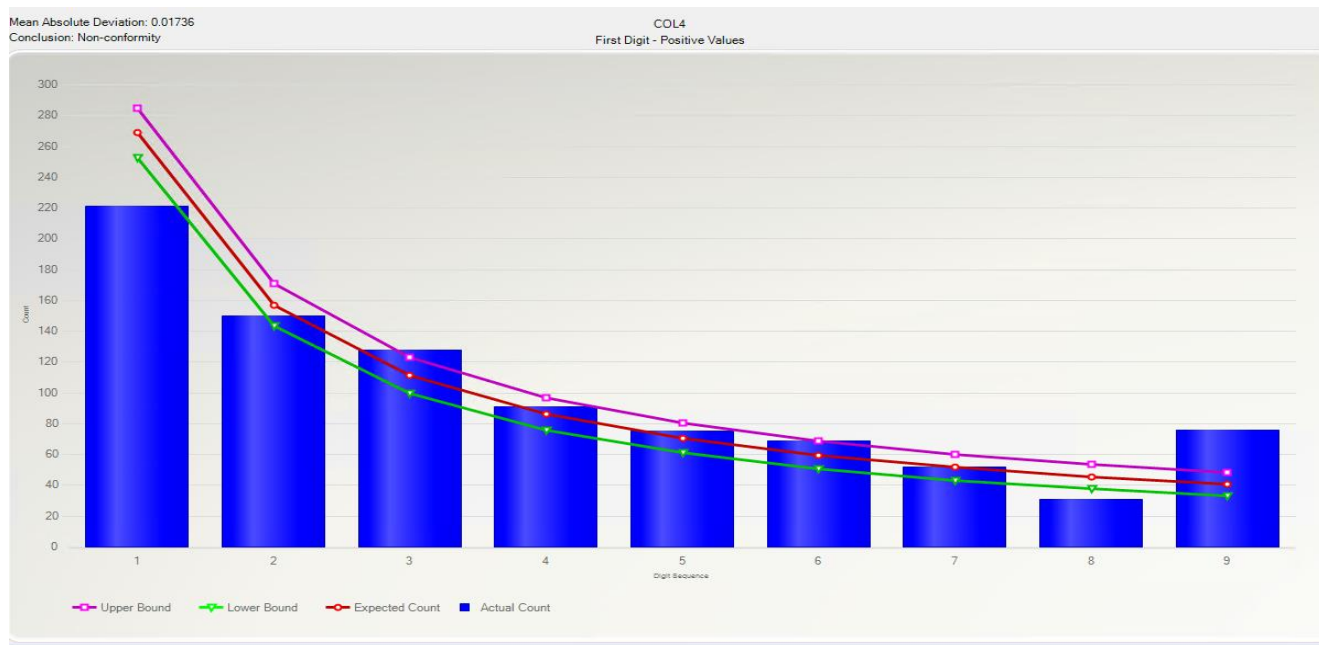
Benford's Law

Example of a cash disbursement transaction population analyzed showing the population is in close conformity:



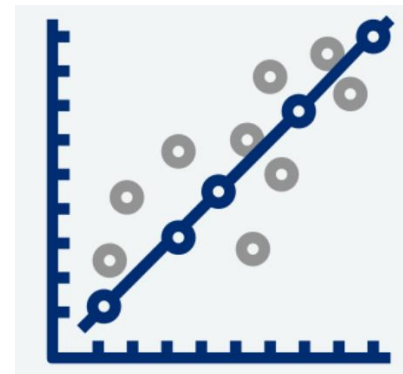
Benford's Law

Example of a cash disbursement transaction population analyzed showing the population is **non conforming**:



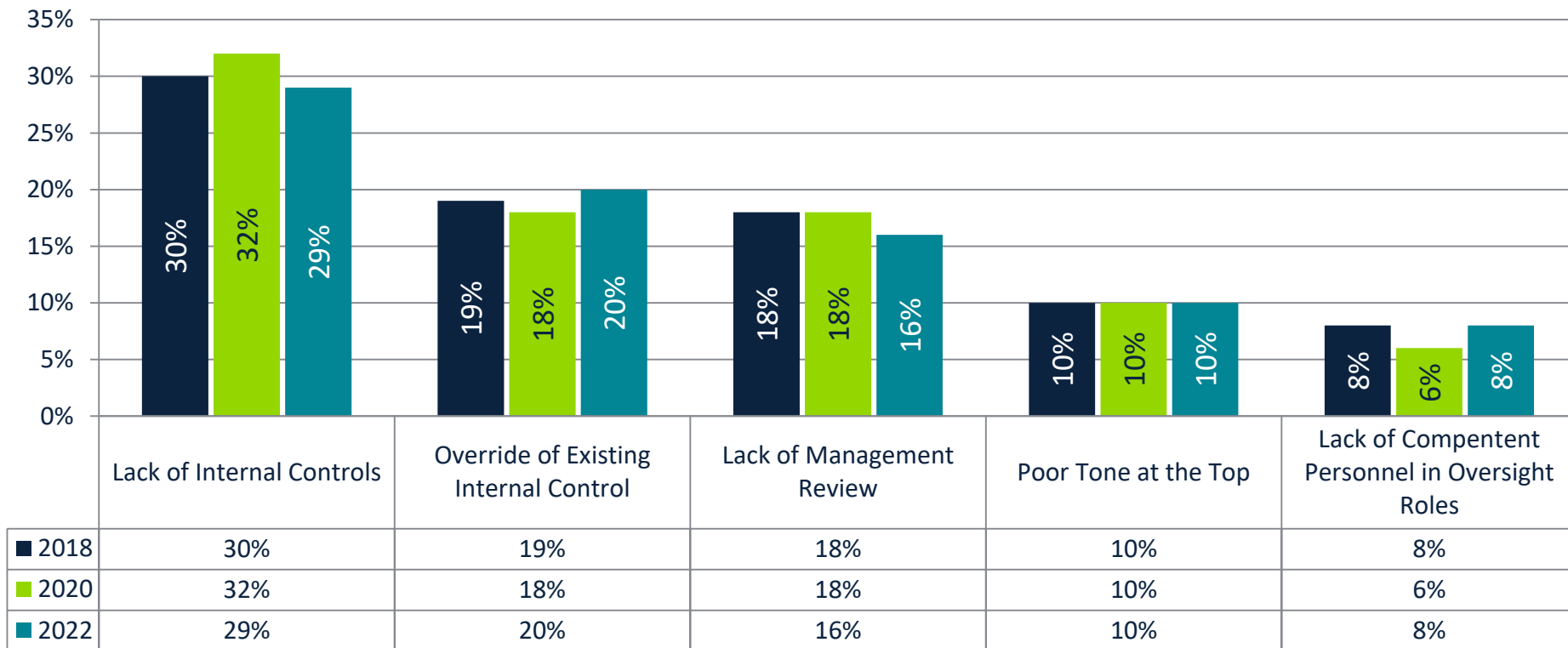
- ▶ General Ledger Data Analysis (transactional level) examples:
 - Out of balance JEs – systems may not allow but good test to confirm
 - Duplicate JEs
 - JEs posted on weekends, holidays, specific days
 - JEs created by each user
 - JEs with large amounts
 - JEs with rounded amounts
 - JEs with amounts ending in 999
 - JEs with specific comments
 - Benford's Law

- ▶ AR balance and transaction analysis examples:
 - Debtors with total amounts/balances greater than credit limits
 - Transactions around a specific date
 - AR duplicate field searches
- ▶ Outlier detection on certain financial data:
 - ▶ Identify unusual items within a database
 - ▶ Systems use various plug ins based on algorithms created, and the algorithms are able to be enhanced



Fraud Prevention Techniques

Primary Internal Control Weakness Observed by CFE



ACFE Report to the Nations 2022 Global Study on Occupational Fraud and Abuse

Do you currently use automation for any sort of data analysis?

- Yes in many areas
- Yes but would like to use it more
- No
- Don't know

The Power of Budgeting/Forecasting

- ▶ Budgeting = developing expectations for future periods
- ▶ Forecasting = developing goals based on future financial outcomes (i.e., “if we do this then...”)
- ▶ Key differences are:
 - Budgets are updated annually typically
 - Forecasts are more flexible and are changed based on market change
 - Budgets are a direction
 - Forecasts are where we want to go (goals)
 - Budgets are more short-term (one year), budgets should not be rigid though
 - Forecasts can be short-term and long-term

- ▶ 7 ways to improve your budgeting/forecasting:
 1. Try and forecast using short periods like quarterly, as markets change so should your forecast
 2. Budget towards your plan (i.e., the last year plus 3% may not work for 2023)
 3. Communicate performance and variances throughout
 4. Involve everyone, not just finance
 5. Track everything you can
 6. Include cash flow and burn rate analysis
 7. Consider budgeting/forecasting software

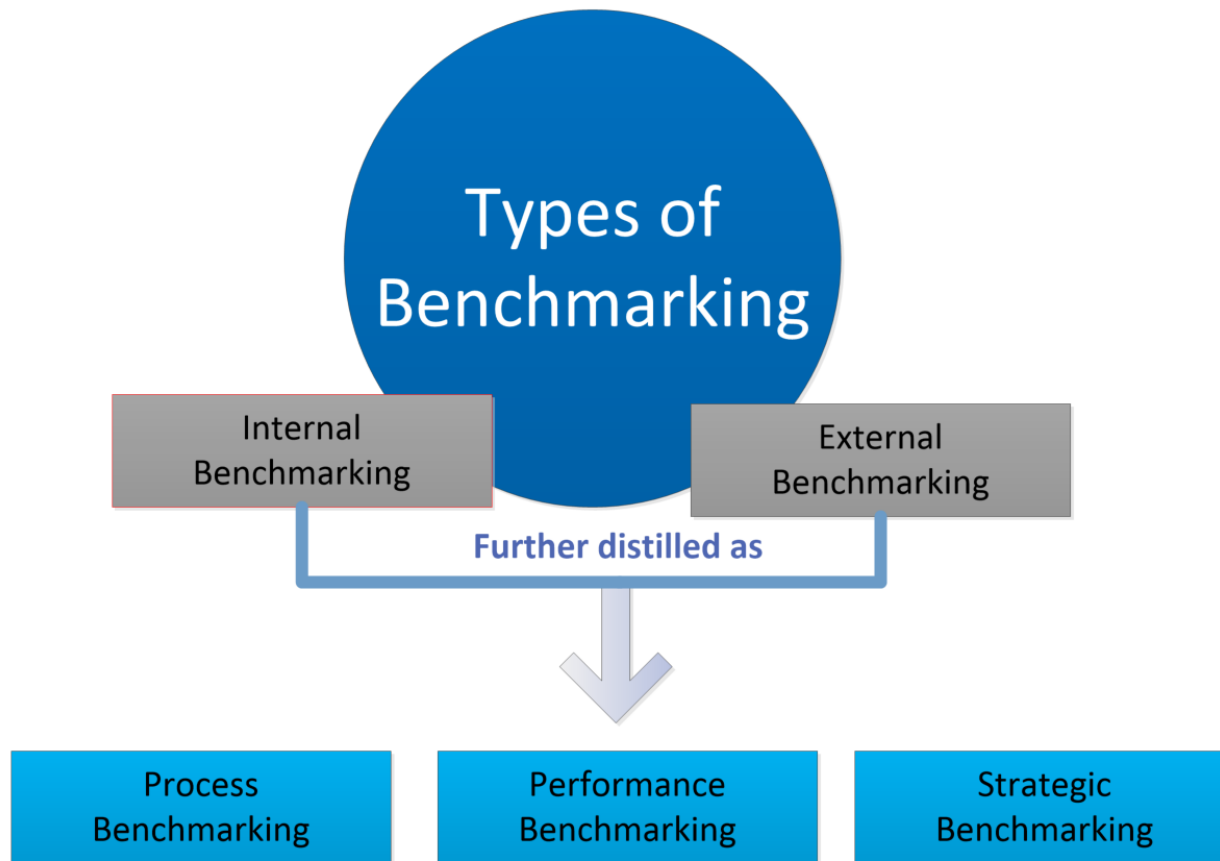
- ▶ Budgets must be part of your data analysis (expectations)
- ▶ Variances must be investigated; talk to finance and others
- ▶ Keep an eye on the prize!



Benchmarking

What is Benchmarking

- Benchmarking is an ongoing process of measuring an organization against expectations, past experience, or industry norms for productivity and profitability. The organization then can make adjustments to improve performance in relation to those metrics.
- Organizations can develop and use both internal and external benchmarks.
 - Internal benchmarking helps monitor and detect trends, based on historical results and statistics, as well as expectation. We already reviewed this.
 - External benchmarking involves identifying a relevant pool of peers (i.e., industry, size, geographic) and creating a detailed analysis comparing the costs and benefits of one organization or capability with another's.
- Benchmarking can be applied to many different aspects of an organization, including elements of strategy, organizational structure, and performance measurement.



How to benchmark

- Clarify the key decision that will be informed by benchmarking
 - How benchmarking could be helpful
 - What specifically is management trying to learn from benchmarking
- Decide on the key data to gather
 - Specific metrics or information needed to improve goals
- Choose the industry or key organizations to benchmark
 - Select organizations that share relevant characteristics
 - Select organizations that are widely regarded as high performing/quality
- Collect data
 - Gather information on metrics via bench research, site visits and interviews
 - Good sources may include annual reports, online databases, industry associations.

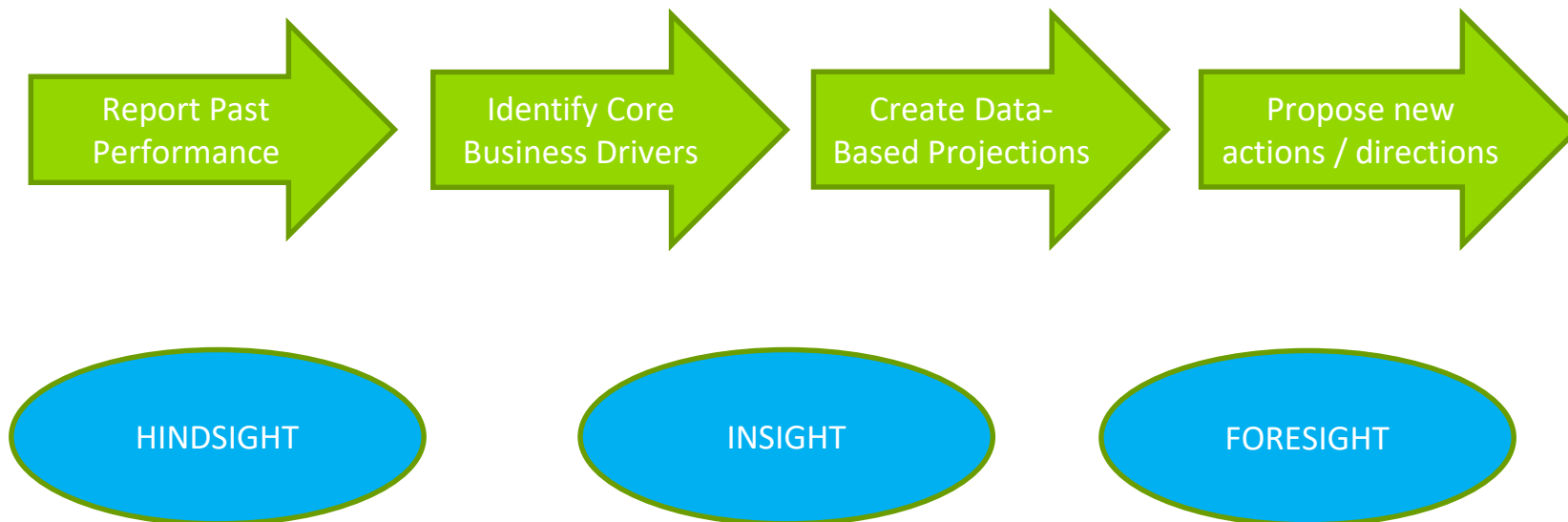
- ▶ How to benchmark (continued)
 - Analyze, decide, and identify opportunities to improve
 - Identify insights and best practices among industry high performers
 - Identify solutions or best practices to adopt
- ▶ Benchmarking is most useful when used to inform specific strategic decisions
- ▶ Common benchmarks – start with top 10 KPIs mentioned earlier
- ▶ Industry association data, purchased industry reporting, public information, peer to peer data, etc. – **this will be the hard part**

Benchmarking (cont.)



Maturity of Data Analysis – Benchmarking - Reporting

Move the analytics from past to real time to reaching for the future



► Resources:

- HW&Co Benchmarking Data – State wide information
- APQC (American Productivity & Quality Center)
- IBISWorld (Market Research.com)
- Integra Business Profiler
- ADP/Paychex (payroll and benefits)
- Trade/Business Associations
- Industry trade groups - OPRA
- NFPs – use 990s and benchmark against competitors
- NFPs – Guide Star, Charity Navigator

Benchmarking Examples

PREPARED FOR YOUR FACILITY

Home Office Direct Care

Benchmarking Example

	YOUR FACILITY	SELECTED FACILITIES AVERAGE	COUNTY AVERAGE	PEER GROUP AVERAGE	STATE-WIDE AVERAGE
AVERAGE HOURLY WAGE BY POSITION					
Protected	\$ -	\$ -	\$ -	\$ -	\$ 18.42
Medical Director	-	-	-	-	22.96
Director of Nursing	30.82	30.66	36.32	35.25	34.33
L.P.N.	23.50	24.40	24.74	23.79	22.42
Program Spec./Director	35.45	35.75	35.26	33.01	29.35
Habilitation Staff	13.45	13.39	14.28	14.35	13.27
QIDP	21.37	21.45	21.34	22.99	22.25
Home Office Direct Care	26.76	26.05	24.85	27.77	25.32
Home Office Indirect Care	22.21	22.21	27.74	29.53	27.13
Maintenance	24.29	23.49	20.72	19.03	18.28

What type of benchmarking are you using?

- Purchased product
- Association/CPA
- Public information/accessible
- Other
- I don't use benchmarking

Dashboards

Dashboards

- A dashboard is an information management tool used to track, analyze, and display key performance indicators, metrics, and data points. You can use a dashboard to monitor the overall health of your business, department, or a specific process.
- The goal of any dashboard is to deliver the right data to the right people in the right timeframe so business decisions can be made. Dashboards can be customizable and should be built to support the specific needs of the users.
- Behind the scenes, a dashboard connects to your files (like an Excel spreadsheet or Google sheet), attachments, services (like QuickBooks or HubSpot), and application programming interfaces. A dashboard can be used to transform raw data into something human-readable. Instead of sifting through columns or rows in a spreadsheet, a dashboard can be used to analyze your data in a table, line chart, bubble chart, or bar chart.
- Provides a organized visual of financial and operational metrics and information.

Dashboard Resources

- Dashboards for a fee:
 - Tableau
 - iDashboards
 - Captain Dash
 - Domo
 - SumAll
 - Geckoboard
 - Fundraising Report Card
- Free Dashboards:
 - Google Data Studio
 - Microsoft Power BI
 - Zoho
 - Dash

► Why consider using a dashboard?

- Dashboards can help you understand large amounts of data and see the significance of the data quickly. Dashboards aggregate data from multiple data sources. A dashboard is about saving time and seeing all of your data together in one place.
- Ideally, dashboards are presented quite simply and graphically, so that decision makers can see at a glance whether and where the organization is on the path it has laid out for itself. Dashboards focus the conversation with areas where improvement is needed
 - A dashboard should:
 - ▶ Align definitions of success across the organization;
 - ▶ Encourage dialogue about progress toward goals;
 - ▶ Facilitate timely identification of successes and challenges;
 - ▶ Ground decisions in concrete data and evidence; and
 - ▶ Illuminate relationships between different activities.
- Select the KPIs that focus the organization on data that will support decision-making

► Examples of types of dashboards:

- Strategic or business intelligence dashboards (i.e., Impact, key initiatives)
 - Track key performance indicators or departments within an organization or the organization as a whole
- Operational or accountability dashboards (i.e., Financial, Sales, and Staff Performance)
 - Shows the data as of now, gives a view of information needed on a daily, weekly, monthly or quarterly basis
- Analytical dashboards (i.e., Web Analytics, Google Analytics)
 - Shows data in a way that allows users to identify trends over time, explore segments, manipulate filters, and search for insights.

► Consider a dashboard that reflects trends over time, or performance against goals and budgets—or both.

Dashboarding Best Practices, hit your target

Tell a Business Story

Business stakeholder involvement



Increase the Level of Automation

Minimal refresh time

On-Demand PUSH delivery

Automatically created

Appropriate amount of information

Actionable Guided Analytics

Dashboard Examples

Dashboards (cont.)

Transformation of Raw Data into format for end user consumption

File Home Insert Draw Page Layout Formulas Data Review

MS Sans Serif 10

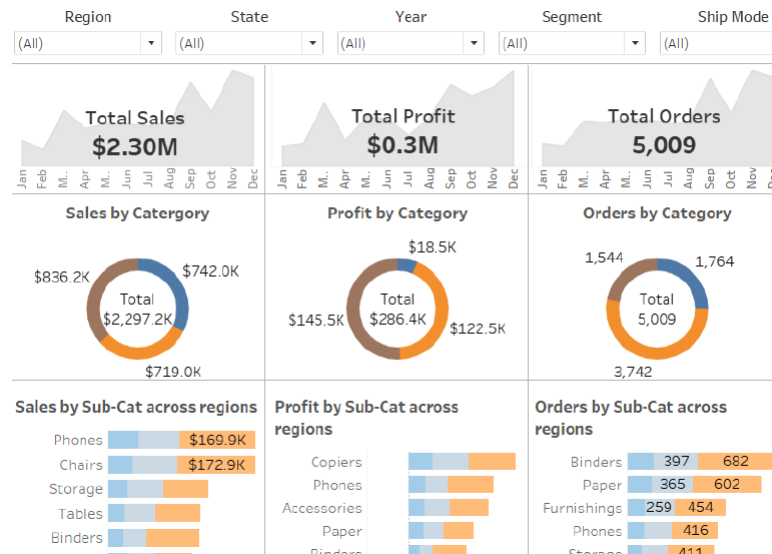
Undo Paste Copy Format Painter

Clipboard Font

Align

D77 12/11/2021

	A	B	C	D	E	F	G
1	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer	Customer S
2	1	CA-2020-152156	11/8/2020	11/11/2020	Second C	CG-1252C	Claire Gut
3	2	CA-2020-152156	11/8/2020	11/11/2020	Second C	CG-1252C	Claire Gut
4	3	CA-2020-138688	6/12/2020	6/16/2020	Second C	DV-13045	Darrin Var
5	4	US-2019-108966	10/11/2019	10/18/2019	Standard	SO-20335	Sean O'Dr
6	5	US-2019-108966	10/11/2019	10/18/2019	Standard	SO-20335	Sean O'Dr
7	6	CA-2018-115812	6/9/2018	6/14/2018	Standard	BH-11710	Brosina H
8	7	CA-2018-115812	6/9/2018	6/14/2018	Standard	BH-11710	Brosina H
9	8	CA-2018-115812	6/9/2018	6/14/2018	Standard	BH-11710	Brosina H
10	9	CA-2018-115812	6/9/2018	6/14/2018	Standard	BH-11710	Brosina H

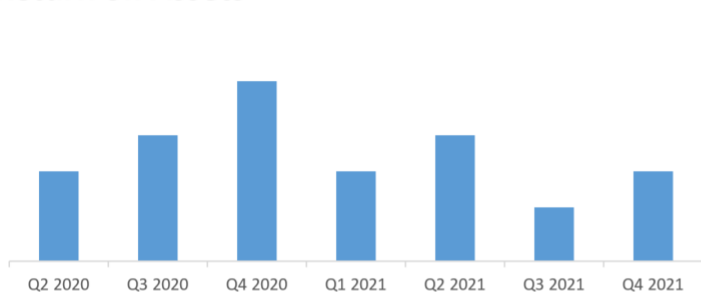


BEFORE – Raw Data

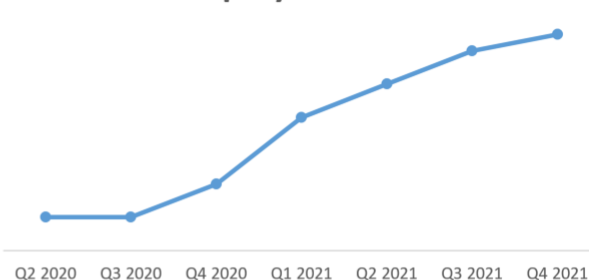
AFTER - Dashboard

Business Reporting Dashboard on Financial Performance

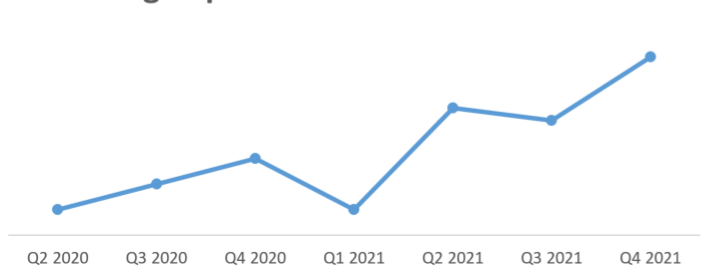
16%
Return on Assets



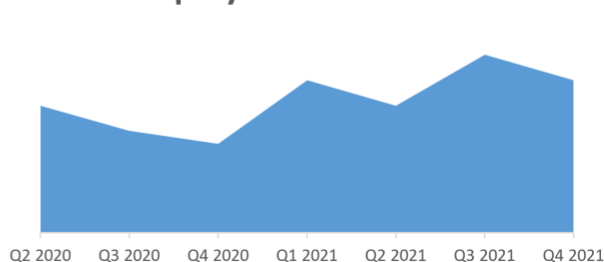
31%
Return on Equity



3.4:1
Working Capital Ratio



0.4:1
Debt - Equity Ratio



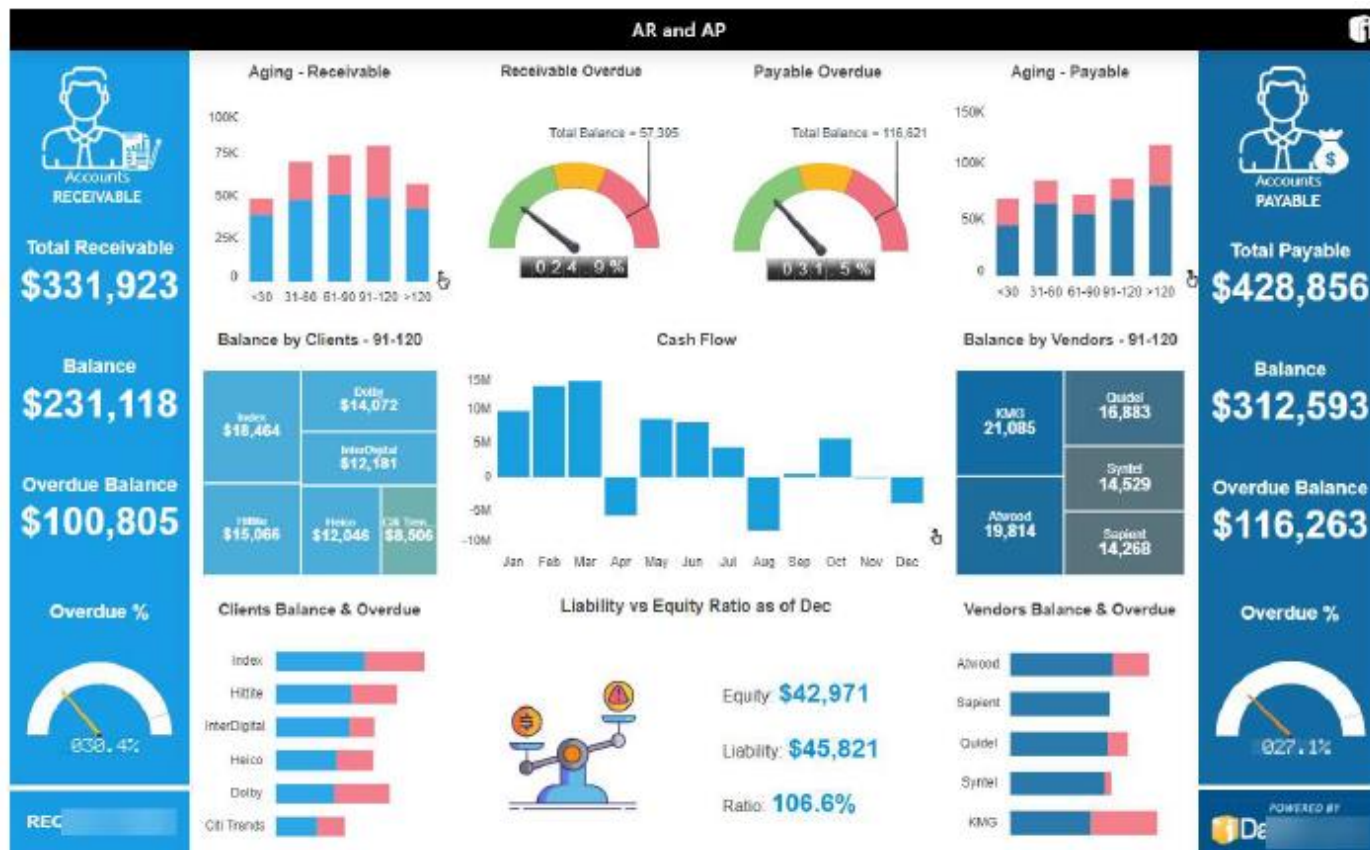
Balance Sheet

Total Assets	\$ 2,825,371	
Current Assets	\$ 1,945,371	
Cash	\$ 497,083	
Accounts Receivable	\$ 915,422	
Inventory	\$ 522,253	
Long - Term Assets	\$ 880,000	
Total Liabilities	\$ 2,825,371	
Current Liabilities	\$ 610,106	
Accounts Liabilities	\$ 418,166	
Other Liabilities	\$ 191,341	
Shareholder Equity	\$ 1,446,620	
Common Stock	\$ 998,720	
Current Earnings	\$ 447,870	

Dashboards (cont.)

PERFORMING ARTS ORGANIZATION					
Recording Period: June				Fiscal Year End: December	
Category	Key Performance Indicator (KPI)	Last Period	Current Period Actual	Target	
Balance Sheet Strength	Months of Liquid Unrestricted Net Assets (LUNA)	2.2	2.5	> 3 mos Meets Target	Green
				1 - 3 mos Within Range	Yellow
				< 1 mo Off Target	Red
Operating Results	Fiscal YTD Operating Margin (Surplus/Deficit as % of Revenue)	2%	8%	> 5% Meets Target	Green
				2 - 5% Within Range	Yellow
				< 2% Off Target	Red
Program Financial Performance	Median Revenue per Performance	\$10K	\$13K	> \$15K Meets Target	Green
				\$12 - \$15K Within Range	Yellow
				< \$12K Off Target	Red
Program Financial Performance	Percentage of Performance Weeks with Free Public Show	12%	10%	> 20% Variance Meets Target	Green
				15% to 20% Within Range	Yellow
				< 15% Off Target	Red
Program Financial Performance	Summer Workshop Enrollment	325	310	>= 315 Meets Target	Green
				< 315 Off Target	Red
Program Financial Performance	Academy Rentention Rate	88%	96%	> 95% Meets Target	Green
				85% to 95% Within Range	Yellow
				< 85% Off Target	Red

Dashboards (cont.)

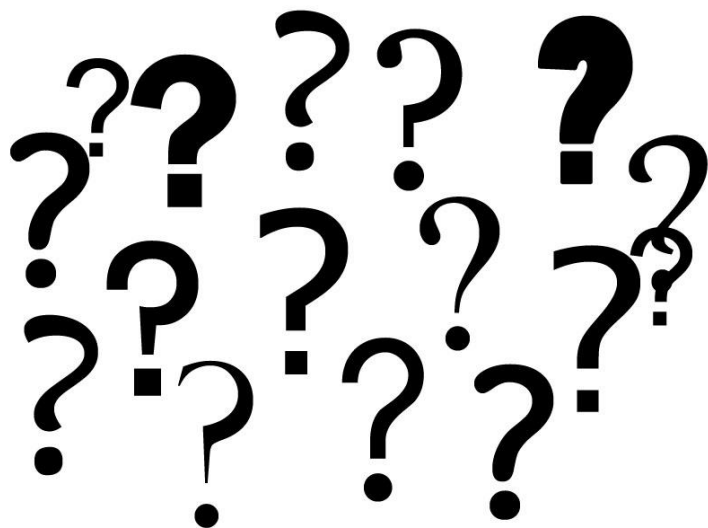


Take-Away Action Items

- ▶ **Data Analysis** is a strong tool to use to combat bad performance and fraud
- ▶ If you are not using **benchmarks** you should start
- ▶ Try and build a **financial dashboard** that your business can run simply and easily on the fly
- ▶ All of these items will help your business **thrive** in these tough times

Questions and Discussion

Let's Talk



Let's Talk



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