

See It.
Understand It.
Pursue It.

Executive management today has come to understand that traditional reports on organizational performance are no longer enough. Finance has finally convinced management they need new tools to provide the visualizations that stakeholders require. The result is new dashboarding tools for finance that are often linked to spreadsheets or files of existing financial information. But is this enough? Finance now needs to provide reports and insights that are often beyond the reach of their current information sources and capabilities.

Why Finance Executives Need Better Tools for Data Visualization

Once upon a time, most finance departments – regardless of industry or business size – invested in information technology. Their noble goals were to provide business units with effective decision support and to resolve accounting issues as quickly as possible. They also discovered that the right tools could enrich financial information in a variety of ways by, for example:

- Delivering precise, up-to-date information – both financial and operational – in the proper context.
- Linking financial information with operational data across siloed functions.
- Aligning metrics with strategy and operations.
- Exploring data, applying analytics, developing insights and connecting with the business.

Each of these examples represents an essential function of any finance department – that is, to give business users access to accurate, timely financial information. But today the story is murkier, the plot thicker and the conclusion inescapable: Performing that function is no longer enough.

The Data Deluge: The Problem and the Promise

Organizations are awash in financial information. It comes in from ERPs. From general ledgers. From subledgers and subsystems. Spreadsheets. Invoices. Journal entries. Bank statements. And it's stored in a wide variety of systems, formats and locations.

In addition, there's an equal measure of operational data (think product counts, volumes, yields and reject rates, headcount, SKU, customer and supplier attributes, and on and on) pouring in from departmental information systems.

On the one hand, this abundance of information may seem like a goldmine. And it is. Or at least it has the potential to be. It's not the data, per se, that will help you make better business decisions; it's the insight hidden within the data that can make all the difference. Trouble is, no matter how much data you have, it doesn't come with ready-made insights that you can reach in and grab like apples on a tree. And even if you have access to millions or even

billions of rows of enterprise data “facts,” that doesn’t mean that you have a complete financial and operational view from which to draw meaningful conclusions about your business.

Your business units face the same challenge. For example, your marketing department may have 10,000, 1 million or even 1 billion instances of customer data in a spreadsheet. But no one can simply look at such a massive spreadsheet and see the hidden correlations within the data. Even the most seasoned marketing professional would overlook correlations between certain customer demographics and individual customers’ preferred sales channels – or their propensity to be early adopters of new products – when overwhelmed by such a large volume of relatively raw data. Nor could product developers or senior executives eyeball a spreadsheet with countless rows of operational and cost data and tease out the growing relationship between high costs, low utilization and a design defect in a specific service or product model.

The Power of Inductive Reasoning

While it’s true that this level of insight starts with raw data, that’s only the beginning. You must slice and dice the data, and build on your discoveries, until explanations and unifying themes and stories begin to emerge from the chaos. This inductive reasoning process is incredibly powerful. And that’s one reason scientists use it in their quests for those aha! moments – when exploration leads to discovery. That’s also why it should be the basis for insightful business decisions.

Naysayers may disagree, claiming that inductive reasoning is a slow process – too slow for the incredibly fast pace most finance departments deal with today. But what if the process of gleaning insight from raw data was much faster? What if everyone in your finance department – from executives to business analysts – could clearly see the correlations and trends hidden in huge volumes of data, in a matter of minutes? Data visualization can make this a reality.

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Data visualization lets you see – literally – all the correlations buried within your data. So instead of looking at rows and columns in a spreadsheet, or a purely numerical report, you can see data represented graphically – and in the proper business context – in trend lines, patterns, charts, etc.

Data visualization helps you instantly grasp the meaning behind the data – and engage in rapid, inductive analytical thinking that can lead to new discoveries and deeper insight. You can easily spot previously hidden patterns and trends. Identify new business opportunities. Uncover potential risks. And make discoveries that trigger further analysis. You can understand data faster and more thoroughly. And use that insight to better manage costs or cash flow. Or oversee capacity and utilization. Or drive profitable growth.

Let’s explore how your finance department could use data visualizations to deliver more value to business decision makers across the enterprise.

Context Brings Clarity

When it comes to understanding and insight, context is everything. And by context, we mean providing situational relevance for data from a business perspective. Relevance is crucial even for something as basic as an expense analysis.

For example, take a look at Figure 1. You can see very quickly that action figures and games have similar expense rates. Stuffed animals are not as expensive to produce, so there may be an opportunity to achieve higher profits and margins on them. If you shared this information with the marketing department, marketers could develop promotions and campaigns focused on the higher-margin stuffed animals, with a goal of boosting profits.

The findings in this example are clear because the data is viewed in context. As another example, consider a geographic context that uses a map with drill-down capabilities that enable you to include products, costs and geography all in one view. You could also use visual context to look at how expenses evolve dynamically over time – viewed in the context of historical trends and seasonality.

By contrast, numbers on a spreadsheet are not “in context.” For example, knowing that the number you are looking for is in row 42, column G gives you no additional insight beyond the number’s value. When you view numbers and events in their proper business context, they become more meaningful and useful.

For instance, “40 out of 50” might be considered exceptional if your industry standard for a certain metric is 50 percent, but it would be considered abysmal if Six Sigma were your objective. Business decision makers must be able to discern this context and its implications at a glance.

How Data Visualization Can Help

With the right data visualization software, you can instantly view data in various contexts and make value judgments about the data. You can quickly see, for example, if “40 out of 50” is good, bad, average or indicative of impending doom. The visual context that helps you make this value judgment may be a dial, slider, chart, thermometer or traffic light with color-coded red/green/yellow thresholds; the right one will make the business relevance more explicit and clear. And it will help you make value judgments about the data faster.



Figure 1: Data + Context = Intelligence, even for something as simple as an expense report.

You can also layer visual contexts to boost the data's value. For example:

- **If operations were managed geographically.** Data points - e.g., KPIs - would appear on a map, and you could click on different regions to see the same KPIs in a consistent order and layout for each region.
- **If physical layout were a critical factor - e.g., a hospital.** Data categories for each department could be context-driven, rather than identical. Only the factors and KPIs relevant to each department would be visible. As such, the KPIs for the emergency room would likely differ from KPIs for the lab, OB-GYN or oncology.
- **If your manufacturing operations were managed as a process flow.** To monitor the effectiveness of your processes, you may want to view data in a way that lets you investigate bottlenecks and determine what impacts they may have, both upstream and downstream.

As these examples illustrate, data visualization software lets you view data in the right context. Doing so enables you to understand the data quickly. Gain insights faster. And answer the most complex questions, understand and improve operations and, ultimately, boost performance.

A Complete Business Picture Requires All Relevant Data

Every departmental manager at some point has struggled to align financial forecasts and budgets with the operational and departmental objectives outlined in the company's strategic plan. One of the biggest hurdles is defining and tracking the right operational metrics.

To do this effectively, you need business intelligence (BI) tools that can pull all operational and financial data together and generate clear, easy-to-understand reports.

You'll typically find that useful metrics are represented as "dollars per something," or "something per dollar." The "somethings" are usually operationally sourced data - think production volumes, headcount, square footage, machine capacity, mean time between failures, miles, basket sizes and so on. To align with your organization's overall strategy - not to mention achieve business success - you really need to operationalize your financials. And to do that, your company's operational data must be integrated with its financial data.

How Better Tools Can Help with Data Visualization

The most effective data visualization software is built on a robust enterprise business intelligence platform that's capable of integrating operational and financial data. Data visualization techniques applied to that data can not only help you better understand the business, but also what's required to execute on strategy.

The powerful combination of visual data exploration and reporting enables you to quickly understand how your business is performing. But that's not all. It also helps you determine why the business is performing the way it is.

Financial analysts, for example, can view KPIs in visually rich dashboards and see immediately that a particular performance indicator is red. The red indicator signals the "what" but not necessarily the "why."

With advanced data integration and data visualization, analysts can explore the data more deeply, ask more questions and get answers regarding "why" the KPI is below target. A good data integration platform enables users to combine multiple data sources into a single view, transform data on demand and sometimes include sophisticated mathematical equations to create the complex KPIs required today. This approach does not rely on traditional spreadsheet models, which are limited in scope and subject to error. And a good business intelligence platform enables analysts to share those insights and understandings with others, further driving collaboration between finance and other lines of business.

But perhaps most importantly, visualizations like this enable the finance department to "operationalize dollars" – or, in other words, combine revenue and cost data from finance with operational data from operating units and present this integration in visuals that everyone can understand quickly and take action on.

Here are some examples:

- Combining call center data with departmental expense data can generate useful insights, such as "cost per on-site fix" versus "cost per remote fix."
- Merging headcount data from HR at a detailed level can not only produce an overall cost per person, but also enable comparisons of CPPs across regions, job classifications and time in position.
- Linking production data with manufacturing costs can yield deeper insight into the financial impacts of line stoppages, underutilized capacity and shipment delays.

Uncovering Unknowns, and Gaining Fresh Insights

For businesses to compete today, decision makers must formulate and answer ever-more-complex questions, test hypotheses and uncover unknowns – such as what the future holds for their industry and business.

It's no surprise that many decision makers regard the finance department's ability to "tell me something I don't know" as its biggest decision-support value. It's fresh insights like these that help decision makers not only identify hidden problems and opportunities within business operations, customer segments and new markets, but also take action to improve business outcomes. Standard management reporting can't support these types of needs. If you don't know what you don't know, how could you determine that the answer you need is on page 11, row 65, column D of a massive spreadsheet? In most cases, you can't.

But if you had a way to experiment and play around with large data sets, you could mine them for the golden insights they undoubtedly hold. If you could actually see your operational and financial data in lots of different ways, you would be able to uncover hidden insights that even a seasoned eye looking at traditional reports would miss.

And if you had the power to explore all that data at the speed of thought, you could apply different techniques for forecasting or use decision trees to gain the business understanding and answers you need.

How Better Tools for Data Visualization Can Help

The most sophisticated data visualization solutions enable you to explore data faster and more deeply than traditional BI reporting tools allow. Imagine being able to experiment with and analyze data instantaneously. To quickly arrive at unexpected insights. And to share those insights by incorporating visualizations into BI reports.

- Forecasting and scenario analysis
- Time-series trends
- Sequence and path analysis
- Mapping

You could, for instance, create revenue reports by location, store,

lifecycle stage or other attributes. And use data visualizations to help line-of-business managers quickly spot trends that could indicate that certain products or customers are at risk.

A data visualization solution with an interactive, self-service environment lets you explore data independently, without having to wait for iterative OLAP cube development by IT. This means that even financial analysts with limited analytic skills can rapidly identify key relationships and uncover insights. For instance, auto-charting enables fast report generation, because the software automatically uses the most appropriate charts and graphs for the data chosen - no guesswork needed.

The right data visualization solution also gives you the flexibility to re-display data in different graphical formats. Viewing different visual formats simultaneously can be extremely helpful; something that is completely obscured in a spreadsheet or data screen may be slightly more evident in a bar graph or pie chart, but instantly and undeniably clear when displayed as a heat map.

And the basic differences between mean, median and mode may seem merely academic if the data is presented in a table; but these differences could significantly alter decisions when they are visually represented in graphs that communicate quickly and fully the impact of their meaning.

More advanced data visualization software combines visualization capabilities with powerful data integration and analytics to filter out “noise” and focus on what’s really important. Even basic analytical techniques can turn a random spreadsheet packed with data into useful insights.

Forecasting and scenario analysis could help you project future revenue, see how various hiring increases would affect operational costs and projected profits, etc., so you could make informed decisions that are highly likely to benefit the business.

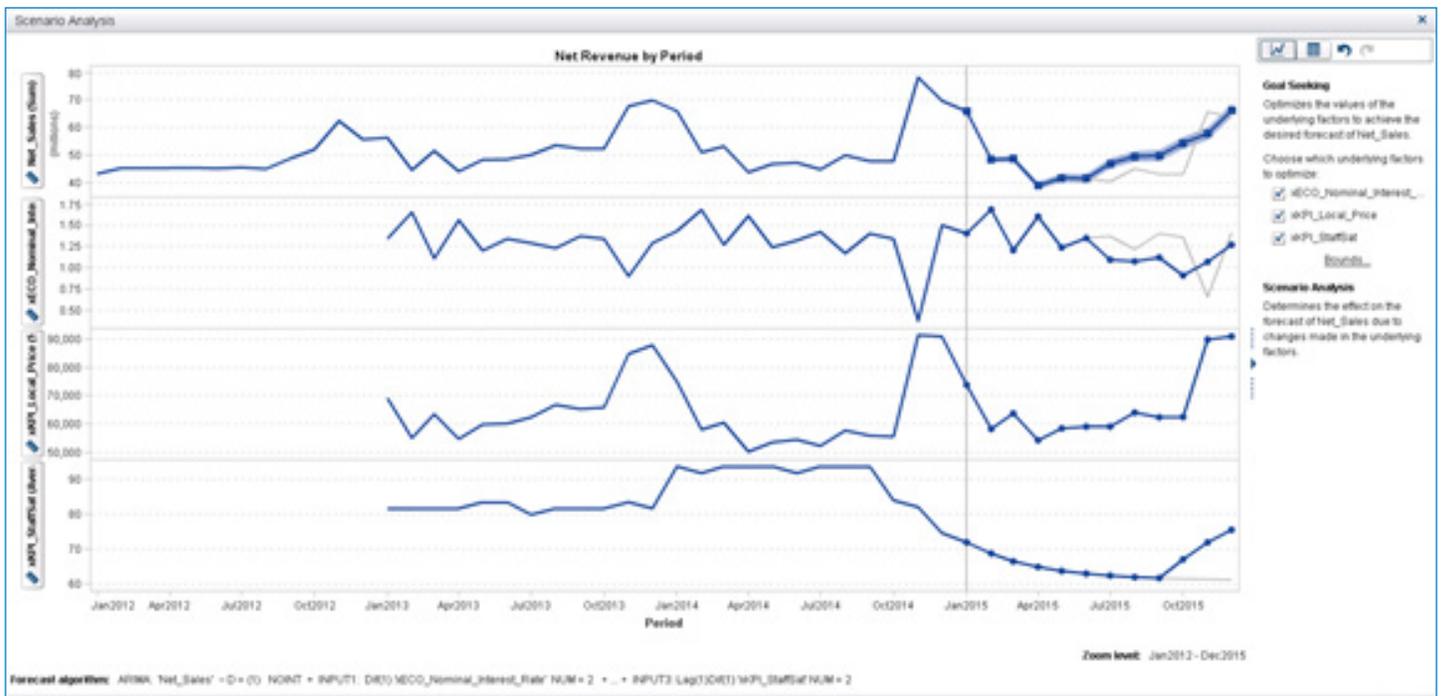


Figure 2: Creating a revenue forecast scenario using help from KPIs

In this example, finance was able to provide an adjusted revenue target that was based on management efforts to reduce their dependence on the traditional fourth quarter spike in retail sales. By first understanding the impact of the interest rate and then measuring the effects of local price manipulations and a staff incentive program, finance was able to provide fact based revenue estimates.

Time-series trends could turn your data from static to dynamic by adding the time component to your presentation, letting the audience actually see how margins have been declining or how uptime has been increasing for some components, but not for others.

- Sequence and path analysis can help you answer questions like “Which shared resource costs or operational activities comprise most of the cost of our best-selling products?” “How do customers navigate our website?” “Where do they get lost?” “When are they most likely to make a purchase?”
- Mapping, though often just a simple spatial representation of data, can lead to important discoveries, such as correlations between specific attributes and physical, political or cultural geographies. Heat maps can both segment and show relationships at the same time. The use of size, color, textual and numeric data is a prime example of “piling on the context” to gain greater comprehension and insight.

Not All Data Visualization Solutions Are Created Equal

There are a lot of data visualization solutions available today. And they all have a lot in common: a nice user interface, the ability to quickly generate standard and ad hoc reports, etc. But they are not all created equal. The difference lies in the data preparation capabilities and your analytics solution.

In fact, SAS® Visual Analytics is the only solution available that goes beyond providing basic data visualization capabilities to include analytic visualization based on predictive and descriptive analytics – as well as reporting and mobile capabilities – in a single offering.

And you don’t have to be a rocket scientist – or even a data scientist – to use SAS Visual Analytics. An intuitive interface lets even those finance professionals with limited technical backgrounds to ask – and answer – unanticipated questions using comparative visual analysis, on-the-fly calculations and correlations, and ad hoc queries – all without burdening IT. Business decision support has never been more attainable than with SAS Visual Analytics.

Learn More

For more information and to test-drive SAS Visual Analytics, visit sas.com/visualanalytics.

SAS® Visual Analytics for Finance at a Glance

An easy-to-use interface with strong analytic visualization capabilities puts the power directly in the hands of finance. In addition, you get:

- Predictive and descriptive analytics in one easy-to-use solution.
- One-touch forecasting and autocharting – no coding required.
- Ability to explore all data – no matter the size of the data set – and test all hypotheses in minutes or seconds.
- Information and insight when and where it’s needed via mobile BI – even when there’s no Internet connectivity.

