

› White Paper



How the Midmarket Can Take Advantage of Big Data: Seven Practical Tips for Getting Started in Data Visualization

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More and more midsize businesses are taking a serious look at data visualization. In a recent midmarket survey, 80 percent of the respondents agreed that putting data to better use could help them improve product quality, uncover new business opportunities and speed up decision making. Ninety-six percent had big data projects either operational or starting up.¹

The reason for these high numbers is simple. Visualizing your data is crucial in making sense out of the huge amounts of it that can now be tapped. But with limited budgets, limited IT resources and (for the most part) no highly trained data analysts on staff, many midsize companies aren't sure where to begin. This paper offers some practical tips on how to get started and what to do in order to succeed. It also covers some specific business functions where visualizing and analyzing data can deliver results.

Practical Tips

1. Build the Business Case

Vague promises related to improved product quality or better customer service are not enough to justify an investment in a data visualization solution. If you want to move to data-driven decision making, you need to think through exactly what the business benefits of better data analysis will be, and how much those benefits would be worth. This is not as complicated as it sounds.

For example, data visualization is very successful at growing the size of shopping baskets by analyzing previous customer behavior (plus other factors) and proposing the up- and cross-sell items that specific customers are likely to choose. A simple spreadsheet can show the dollar value of a 1 percent increase in basket size, a 2 percent increase, and so on. The same sorts of questions can be posed for any aspect of a business: operations, engineering, human resources, finance and even IT.

What-if scenarios like these are not difficult to calculate, and they put the need for a data visualization solution on a solid business footing.

2. Collaborate and Cooperate

Data visualization is an area where you can't go it alone. The midmarket survey already cited identified successful collaboration between business units and IT as one of the most important success factors in data analytics projects, and lack of cooperation between the two as the most important cause of failure. The message is obvious: If you're a business manager, you have to get IT on board, and if you're in IT, you have to sell the business managers.

Another related success factor is obvious but still worth stating: Buy-in from senior management is essential to success.

3. Democratize Your Data

Data visualization solutions were initially developed as a business tool for enterprise-scale companies that could afford to hire statisticians and other data scientists capable of sophisticated data analysis. Often, these experts functioned (and still do) as internal consulting groups. This model is too expensive, slow and clumsy for midsize businesses, and should be avoided at all costs. If you're serious about making data-driven decisions the rule in your organization, you have to make the data upon which decisions are based available without intermediaries - and in a useful form.

This is an area where having the right technology plays a huge role. Data visualization solutions now exist now that not only serve the needs of experts, but can also be put to use by nonspecialists. In essence, these solutions guide managers through a self-service analytical process. It's possible, for example, to systematically analyze data to see which variables are strongly correlated with desired outcomes, or not correlated at all. This eliminates the need for manual trial and error at the beginning of a project to determine what data is relevant. These solutions also simplify the process of communicating insights by suggesting the best way to display data, e.g., with bar charts, pie charts, heat maps or scatter graphs. In other words, they go far beyond the capabilities of spreadsheets, without requiring specialized training.

4. Ask for Help

Don't let a perceived lack of technical talent stop you. If you have a clear business objective, you can engage consultants on a limited basis to obtain the technical expertise you need to get a data visualization tool up and running, as well as customized training for the user base. This is a much more practical (and economical) approach than trying to hire the talent you need, which may be hard to attract if your business isn't a giant.

¹ <http://software.dell.com/docs/roadblocks-crumbling-midmarket-companies-see-early-success-with-big-data-28864.pdf>

5. Don't Ignore the Need for Speed

The speed of a data visualization solution isn't something that only concerns the IT department. A system's speed has two very practical business consequences.

The first is that managers who are trying to figure out a problem need a system that works in real time. Problem solving in the business world is an iterative process where each answer leads to the next question. If each answer requires an hour of calculation, it's very difficult for users to maintain continuity of thought. Managers tend to be men and women of action. They're likely to abandon a system that requires days of patient waiting to deliver a useful result.

There's another, more technical, reason why speed counts. A slow system simply can't process the vast amounts of data now available to midsize companies. The workaround for this problem is to analyze samples rather than the whole data universe. Unfortunately, selecting samples that will accurately represent a larger body of data requires a level of expertise that midsize companies rarely have.

To repeat, the value of data visualization is proportional to the number of people in an organization who can work with data directly, with no help from experts. The bottom line here is that you need a fast system. Slow systems make visual analytics impossible in midsize businesses.

6. Look Beyond Dazzling Graphics

Good looks can only take you so far. A variety of report generators are available that can build impressive charts, graphs and even dashboards. While these products do a good job of communicating what you already know more effectively, they cannot tell you what you don't know unless they are backed by robust analytical capabilities. At minimum, look for the ability to drill down into the data easily, to create charts automatically, and to provide geomapping capabilities.

7. Leverage the Cloud

You don't necessarily have to invest in an on-site system in order to gain the benefits of data visualization. On-demand solutions offer quick time to value, with no burden on the IT department to install and maintain yet another system. They also have a positive financial impact, with no CAPEX costs and – at least in most cases – lower total cost to the business.

Data Visualization at Work: Marketing

The fundamental challenge in marketing – connecting the right product with the right customer at the right time and with the right price – hasn't changed in the last 50 years. What has changed is the ability to more precisely define these four key elements in the marketing equation. "Right customer" is a good example. Not too long ago, customers were defined by gender, age, household income, ZIP code and little more. Now, literally dozens of other factors can potentially be taken into account, ranging from detailed transactional data such as purchasing histories to recent online behavior.

The key to leveraging all this customer data is determining what's important and what's not, or, more precisely, identifying correlations between specific customer attributes and product sales. That's where data visualization comes into play. It can very quickly examine relationships between various classes of data and visually display strong correlations, weak correlations, or even negative correlations.

This sort of analysis can be expanded to include factors like sales channel, seasonality, marketing approaches (focus on price, certain features, etc.) and others. It's also possible to explore correlations to see, for example, if a preference for wool sweaters vs. cotton sweaters is national or regional.

Data visualization not only provides insights, it also displays them in ways that make it easier to identify opportunities and communicate them within an organization. Heat maps, for example, can display geographical information in ways that no set of numbers or simple pie chart can match.

Data Visualization at Work: Quality Control

Improving quality is an ongoing effort for all types of operations, but there are a huge number of variables that affect quality metrics, like first pass yields, defects per unit or fill rates. These variables can include the vendors supplying the input materials, the amount of training invested in the employees, ambient conditions at the time of production, and a dozen or more other factors. The ability to analyze all these variables enables managers to target root causes with tangible actions (e.g., eliminating a particular supplier) to quickly solve quality problems.

Utilization rates are another area where data visualization can help. For example, many midsize manufacturers are under heavy pressure to maximize utilization of expensive CNC machines. Data visualization tools can provide dashboards that map the physical layout of a factory with dials, thermometers or

traffic lights to track utilization of specific machines and give managers a comprehensive overview of operations so they can quickly spot bottlenecks.

Even more important, production data can be integrated with other supply chain data so that the causes of slowdowns can be identified and eliminated.

Data Visualization at Work: Finance

The data that's available to CFOs is unique in that it relates to every department in the company. Because it spans the silos of sales, marketing, operations and so on, it has the potential to provide a global picture of a company's health and, equally important, to reveal hidden relationships that can be exploited to improve profitability.

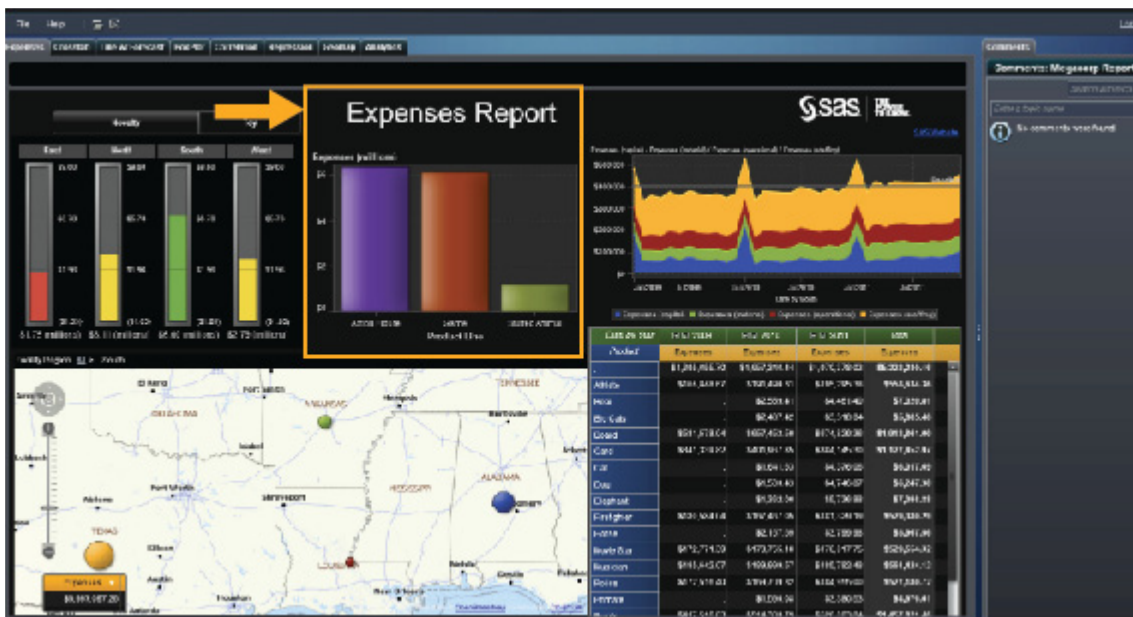
For example, a company's sales department can easily rank the products in its portfolio in terms of revenue, but most likely has little information about the cost of production for each of those products. In contrast, operations knows how much products cost to make, but little data about how well they sell. If marketing knew that Product A had a lower expense rate than products B or C, it could focus marketing efforts on product A and increase overall profitability.

Both finding and conveying information like this isn't easy when it's buried in spreadsheets or other rows-and-columns reports. In contrast, visual analytics can reveal such insights. The screen below showing the relative costs of action figures, games and stuffed animals for a fictional toy manufacturer is an example of how easy it can be to spot business opportunities with the right tools.

Data Visualization at Work: Human Resources

For most midsize companies, payroll is the highest single controllable expense. Nonetheless, these companies are all too often in the dark about basic questions related to workforce issues. Which candidates for sales positions will be most likely to succeed? Which assembly line workers will be least likely to have an accident? Which training programs yield tangible business results like improved productivity, and how much do those results cost per individual? What are the primary causes of employee turnover?

Data visualization solutions can provide reliable, data-driven answers to questions like these - and these answers are often unexpected. For example, one company that carefully examined variables in the backgrounds of candidates for sales positions found that the absence of typing errors on a resume was a better predictor of success than college GPA.



The expense report in this dashboard (orange arrow) clearly shows the cost of production for various products that could easily be missed in a rows and columns style report.

A data-driven approach by HR enables companies to pick winners, boost output per employee, improve attendance, reduce turnover and in general maintain workforce stability. Moreover, visual analytics can help HR professionals clearly communicate workforce issues that could affect the bottom line to other departments, adding a strategic component to their current administrative functions.

The SAS Advantage

SAS is a pioneer in bringing the benefits of data visualization and analytics to businesses of all sizes. SAS® Visual Analytics offers an affordable, on-site or cloud-based solution specifically designed to meet the needs of line-of-business managers as well as sophisticated data scientists. By combining dashboards, reporting, BI and analytics, SAS Visual Analytics provides both data visualization and analytic visualization. However deeply you want to explore your data, SAS Visual Analytics provides the capabilities and visualization techniques to take you there. And with years of practical experience and ultrafast in-memory processing technology, SAS is the ideal partner for midsize businesses that want to exploit their data for competitive advantage.

The best way to understand the power of data visualization is to try it for yourself. To get started, go to sas.com/vademos to browse sample reports, or explore on your own with a cloud-based demo.

To contact your local SAS office, please visit: sas.com/offices

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