

Wall Street & Technology

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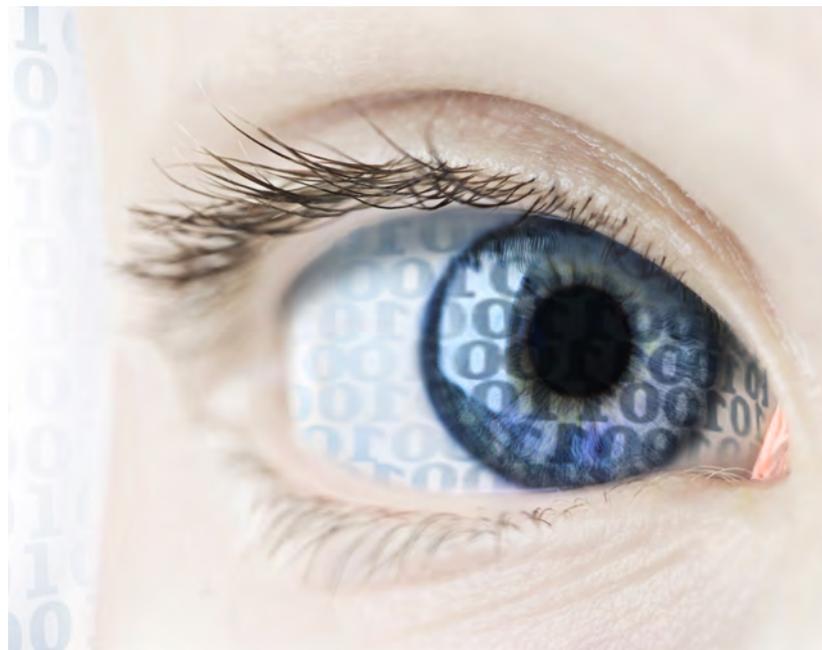
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In the hunt for alpha, Wall Street firms look for the right data visualization technology to make sense of petabytes of structured and unstructured data. >>



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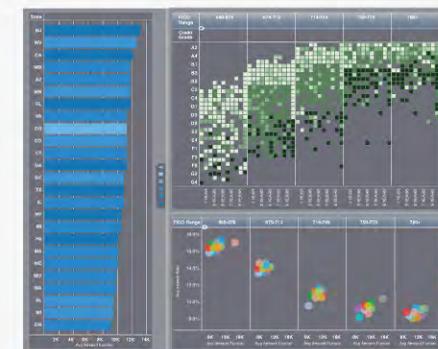
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fromtheeditor

Data's New Look

Data, data and more data. All we seem to hear about is how data is growing exponentially. This column is essentially data, since it's being delivered to you electronically. So yes, *Wall Street & Technology* is helping to grow the amount of data in the marketplace.

More seriously, however, data is becoming a larger challenge for all companies and especially for financial services organizations. They traditionally have been able to handle large amounts of market data. As data volumes increase, which they have been doing for years, and as new types of data get thrown into the data analysis mix, financial firms are facing additional challenges. For instance, what can they actually do with all of the data?

Big data technologies and strategies are helping financial firms deal with data in new ways. Just a few short years ago, many firms never even considered using big data on an enterprise level. New regulatory requirements, however, are demanding that companies report enterprise-wide data to improve financial transparency. Big data strategies

help aggregate information from across the enterprise, analyze it and generate reports to senior executives.

Other specialties inside of financial organizations are looking to use data from social media, mobile, retail, weather information and other consumer channels to help define strategies, pick stocks and set guidance for investors. These types of information represent a growing overall percentage of data that IT shops must manage. As one New York-based CIO of a large brokerage firm told me recently, "Once users get a taste of big data, they want more and more."

A Better View

However, managing the data is only part of the challenge. Most business users aren't Excel aficionados or stat gurus. While some members of the C-suite love to dive into spreadsheets and crunch numbers, most prefer snapshots that can represent data visually. Heat maps and dashboards that present fixed data points have been around for a while, and most firms use these tools in a variety of areas — on the trading desk



Greg MacSweeney, Editorial Director

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and for portfolio and wealth managers.

Modern data visualization tools, however, take the heat maps of yesterday to a new level. Users can manipulate data to show different outcomes, or "what if" scenarios. Often these tools are in 3-D, and can be manipulated on screen or even on an iPad without having to contact a data analyst to rerun a report, or modify an algorithm.

Still, data visualization is complex and requires organized data to show realistic outcomes. As the technology continues to mature and become more user friendly, more business users and executives will request, and eventually demand, data visualization to make their workflow more productive and, hopefully, their customers more profitable. ■

*wealth*management RISK PROFILING

How To Make Values Visible

Yeske Buie adopts cloud-based analytics tool to capture, measure and visualize client risk tolerance.

By Anne Rawland Gabriel

Although most of the industry buzz is around big data and social media, they're far from the only technologies in town. A variety of new software tools assist wealth management firms with visualizing and analyzing data — for instance, to gain better insights into an individual investor's attitudes around risk.

Wealth managers have long gathered customer sentiment data manually, but it's often documented "only in the minds of the relationship managers," says Rodney Nelsestuen, a senior research director with CEB TowerGroup.

"While this works well when things are going well," he says, "automating the gathering and evaluation of data, as conditions change, can provide early warning to investment firms and their customers."

This is particularly true after the financial crisis, with investor trust low and behaviors changed, Nelsestuen adds. "Visualization provides the translation of data sets and analytics into human-readable knowledge and insight," he says.

Those ongoing insights let relationship managers take action when circumstances move beyond an investor's risk tolerance, he says. "This manages risk in two ways: first, the risk of losing a customer and, second, the risk of an investment decision going bad, catching both investor and relationship manager off guard," he says.

For the principals at wealth management and financial planning firm Yeske Buie, also known as YeBu, visualization is centered on measuring the risk tolerance of individual investors.

"We've built our business based on providing evidence-based advising," says David Yeske, co-founder of YeBu, whose headquarters are in Vienna, Va., and San Francisco. "As we brought on new employees, it was important to ensure

consistency across our advisers and over time.

"With more junior advisers joining our firm," he adds, "we realized we needed to move beyond using intuition, gained from our years of experience, to evaluate risk tolerance."

Dissertation As Starting Point

In early 2011, Yeske kicked off his search for a risk management platform by rereading the 2005 doctoral dissertation of a former Golden Gate University colleague, Doug Rice, titled "Variance In Risk Tolerance Measurement: Toward A Uniform Solution." In it, Rice described collecting risk tolerance instruments used by organizations worldwide. "He fed a common fact pattern through them all," Yeske explains. "The output was wildly disparate assessments because people were, essentially, making [the analytical models] up by the seat of their pants."

As YeBu evaluated the tools, it discovered multiple products that failed to separate risk capacity,



"Our clients are more confident our advice is tangibly connected to them."

— Dave Yeske, Yeske Buie

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perception and tolerance. “They tended to confuse the different elements of risk assessment and jumble them together,” Yeske says. “The three don’t have anything to do with one another.”

More research led YeBu to choose the risk-profiling tool of Sydney-based FinaMetrica. “There is no other [packaged] instrument — that we’re aware of — that has been so thoroughly grounded in the empirical evidence and psychometric analysis,” Yeske says.

CEB TowerGroup analyst Nelsestuen confirms there’s a paucity of packaged risk-profiling tools. Several vendors, including IBM, Microsoft and SAS, can help companies create a framework, he says, but “packaged applications that provide a one-stop source are hard to find.”

Part of what attracted YeBu to FinaMetrica was the cultural fit. “In addition to having built a large data set, validated across populations in multiple countries, FinaMetrica shares data with academics who study risk tolerance,” Yeske says. “So they’re part of a virtuous [research] cycle. That was also attractive to us.”

Work Processes Modified

Since FinaMetrica is cloud-based, YeBu didn’t need to make any infrastructure in-

An Unexpected Benefit

During the course of adopting its risk-profiling tool, FinaMetrica, Yeske Buie uncovered an unexpected benefit: business development.

It all started when the financial planning firm experimented with asking prospects to complete a profile survey in advance of their first meeting. “We discovered we had a deeper connection with a prospect from the minute they arrived in our office,” co-founder David Yeske says. “And it made initial consul-

tations much more productive.”

In fact, the practice is proving to be something of a competitive advantage. “It’s a powerful way to differentiate ourselves,” Yeske says. “We also have the sense it’s improved our propensity to receive referrals. It’s even helped us bring on clients we might not have otherwise gotten.

“Best of all,” he adds, “it doesn’t even cost anything to have a prospect fill it out in advance.”

— ARG

vestments. Advisers set up clients in FinaMetrica, which emails them a link and login credentials.

After inking the deal with FinaMetrica in February, YeBu discovered the biggest challenge was incorporating the tool into its bicoastal work processes. One goal was to enhance its internal deliberations and client communications. It used FinaMetrica’s risk profile reports as part of client presentations to explain investment strategy recommendations and posted those reports on private client pages, which are

workspaces accessible to clients, Yeske says.

Less obvious was how to coax clients to complete the initial profile survey in the first place. YeBu found that it was easier to have clients fill out a paper copy and then it would key in the information.

“Regardless whether a client opted for electronic or paper survey delivery, motivating the individual to actually complete the form required some trial and error.

“For clients that agreed to online delivery, we found the majority would fill out the form

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within a week of receiving the link,” explains Yeske. “If a client didn’t fill it out within a week, then we’d send a reminder with the link. If there was still no response, then we’d send a PDF and ask them to print it out and return it. If that didn’t work, then we’d mail them a form.

“Of course, for some, completing the paper forms face to face was the best mechanism,” Yeske adds. “Regardless, by establishing this process we’ve had a 99% success rate at getting clients to complete the profile.”

Out Of The Park

No matter who completes those surveys, the resulting output — which comes as a combination of graphics and narratives — has been a home run with clients. “They love talking about themselves,” Yeske says, “and the risk profile is a mechanism to have that conversation. Plus, they seem happier when we explain our investing recommendations, because they’re more confident our advice is tangibly connected to them.”

The effect of FinaMetrica is particularly pronounced with couples, he says, as they become “really engaged in talking about their similarities and differences.” Having the profiles helps the firm’s advisers explain how they’re blending their advice to fit the needs and expectations of both individuals.

If there’s a final benefit, it’s organizational risk management. “We can show regulators that we’re doing our due diligence around collecting key information about our clients,” Yeske says. “But that’s definitely the least of the benefits, in my mind.” ■



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In the hunt for alpha, Wall Street firms look for the right data visualization technologies to make sense of petabytes of structured and unstructured data.

DATA VISUALIZATION'S NEW SHINE

By Melanie Rodier

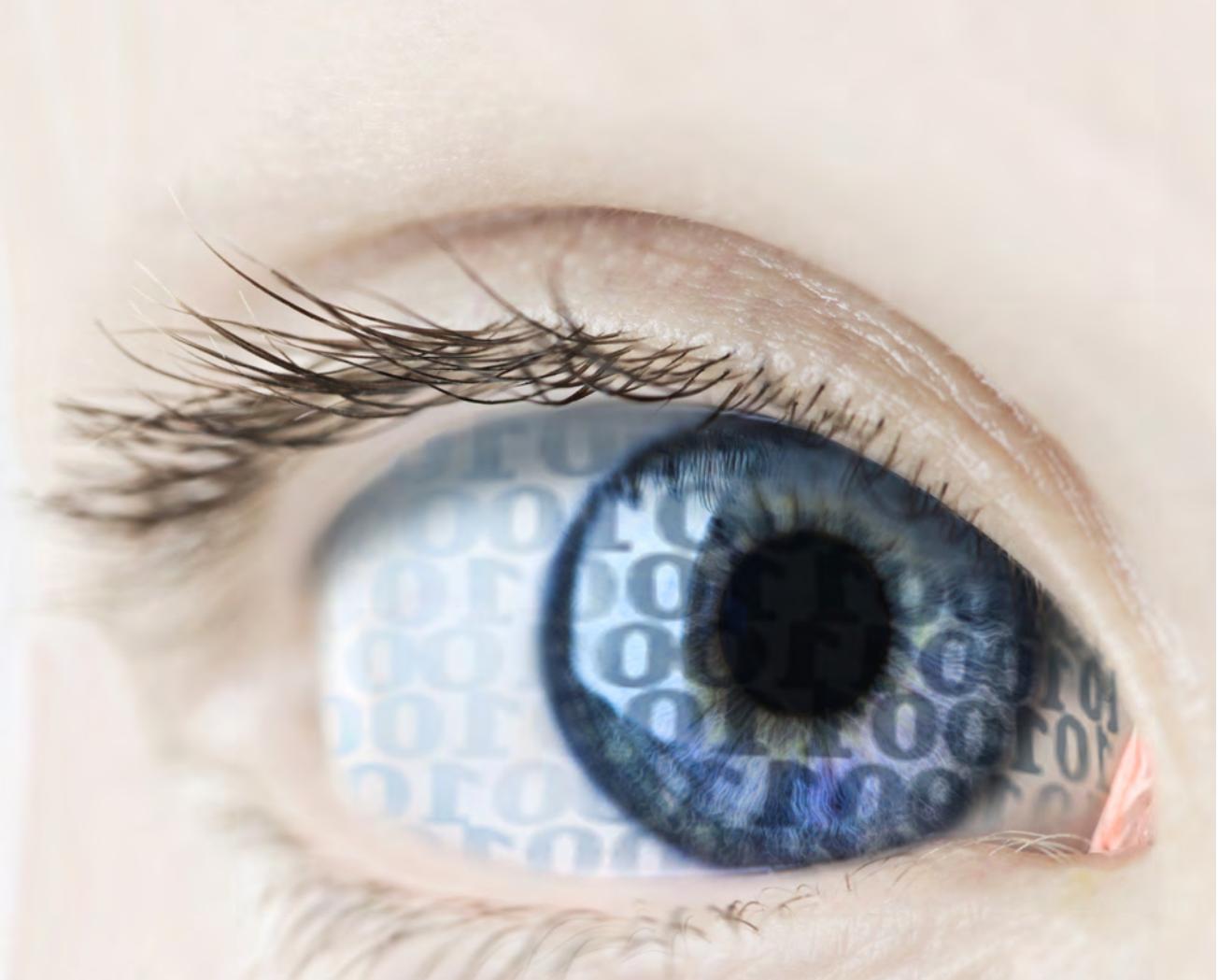
A **a single transaction travels in nanoseconds** from an electronic trading firm to the market, it makes its way through an internal network, expands to a wider network between sites and eventually to other complex data centers and to the exchange's own infrastructure. Each one of these moving parts provides feedback to the user and leaves a trail of data along the way.

Considering that billions of messages are sent at any single second during the day — U.S. securities message rates have been growing 30% every six months over the last decade, according to advisory firm TABB Group — gathering all

these bits of data and distilling them is a herculean task for any trading firm.

Wall Street firms that are hunting for alpha, while keeping the regulators happy, are using new data visualization technologies to see which transactions traders should focus on, while their back offices are using visuals to help them sift through millions of data points to make sure each trade is compliant with regulators' demands.

"It's about identifying what's useful and not. And that will change all the time as people are doing different things at any one point in time," Chad Cook, CTO of Lime Brokerage, said during a recent *Wall Street & Technology* webcast. "It's difficult



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for humans to process all this information in a way that is effective.”

Today, financial executives are accustomed to glancing at reams of data in lists, tables or grids, and gleaning within a few seconds whether there are any anomalies or what is the most valuable information. But if you talk to traders, they will tell you that if you have a list with more than 25 or 26 items on it, you’re merely managing things off the list rather than seeing which are valuable, reports Jarlath Forde, creative director at Sapien Global Markets. “Where you start to get value is when you can communicate an insight visually and use a tool to help them prioritize what they’re doing,” he notes.

Traders can use heat maps to give added meaning to unstructured data such as tweets, helping them decipher instantly, for example, whether an unusually high number of tweets is linked to positive or negative sentiment around a certain stock.

Drilling into a heat map that shows you tweets about Microsoft could show you what these tweets have in common at any point in time, such as the mention of Windows 8, while drilling in further might show

you tweets with both that word as well as Surface Pro, Microsoft’s new tablet. “So it might tell you the reason the world is interested in Microsoft,” says David Polen, head of business development at Fidessa.

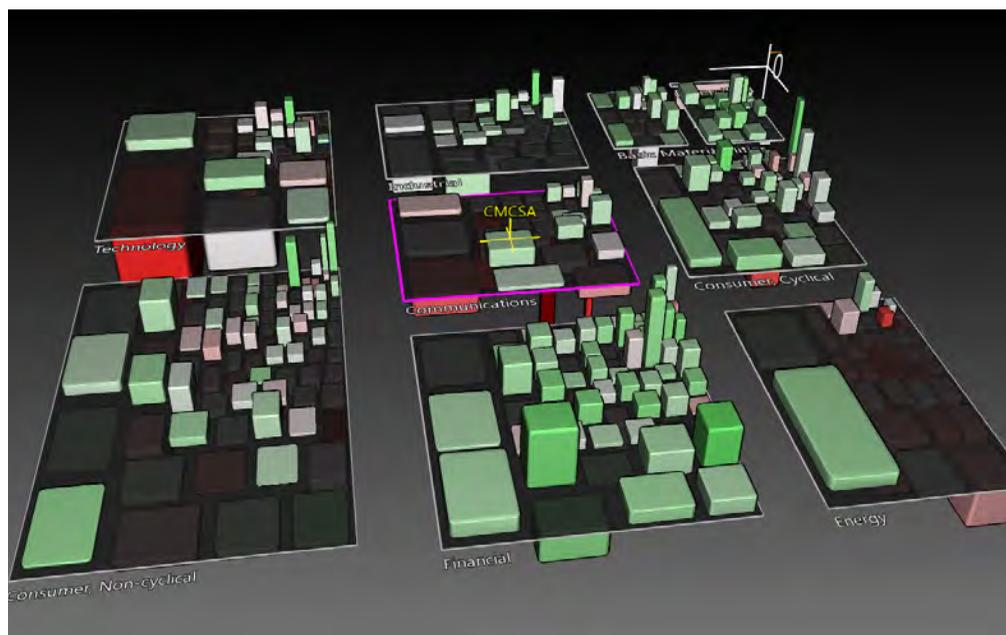
Fidessa is using data visualization technology to enable brokers to gain more value from their conversations with clients. Questions the buy side is asking include, “Where should I be trading my stock? Did my broker buy stock in the right venues? How well is my broker representing fragmentation in terms of purchasing stock?” Polen says. Clients want to know when a stock traded and whether it traded on an exchange or in a dark pool, he explains.

“Predictive analytics isn’t worth that much. It can show you a lot. But the best way is to make analytics that are simplified,” he says, pointing to Fidessa’s own Fragmentation Index, which provides a global heat map allowing users to measure, compare and track the fragmentation of liquidity wherever they happen to be in the world.

Data visualization helps people filter down their investment options rather than just creating list-based screeners, adds Sapien’s Forde. “One of the things we see is most systems today are highly transactional. They’re about the entry of a trade, not about supporting a trader in what to trade in and when to trade it,” he says.

Brokers are now using data visualization to help them to determine when to call the buy side, Polen notes. “You don’t want to call [clients] every four minutes, but you do want to call them when you can provide good service,” he adds. “We analyze when is the moment you should reach out to them. We also invented new analytics predicting the success of the conversation,” he explains.

Forde agrees that the sell side wants to know while a client is on the



Aqumin’s AlphaVision software creates a real-time display of stock market data. Buildings represent individual stocks and are grouped into market sectors. Tall buildings indicate buying pressure, green indicates a stock is up, red indicates a stock is down and white is unchanged. A lot of tall green buildings across the whole market shows that the market is up.

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phone how much of an incentive to give him. "I could have looked up how profitable a client is and it would have taken 10 minutes. Now I have him on the phone, and I want to know now. Data visualization is a great tool to do that. I want a visual to see how much flow has been coming from him," he says. "It's additional layering, which traditionally had information in different systems, not connected together."

Traditional tools do not give you fast and easy data discovery or foster the discovery of new trading opportunities, notes Oleg Komissarov, senior VP of enterprise solutions at DataArt, a custom software development

firm that recently partnered with Aqumin, a maker of 3-D real-time visual interpretation software.

Standard tables representing two-dimensional data visualization tools such as grids, charts or diagrams and some

"Most systems today are highly transactional. They're about the entry of a trade, not about supporting a trader in what to trade and when to trade it."

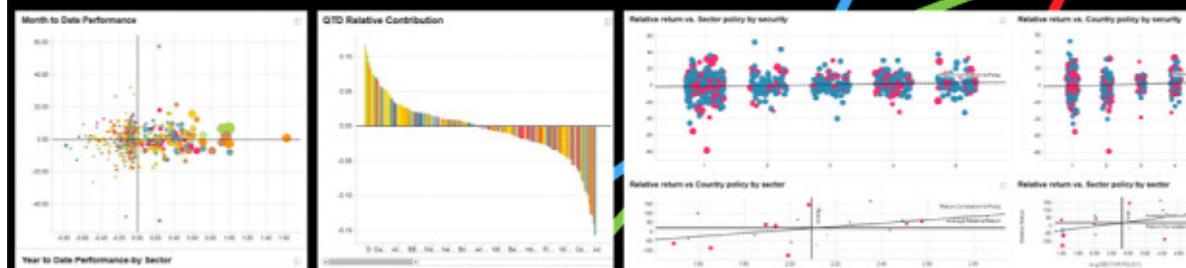
– *Jarlath Forde, Sapient Global Markets*

charts are still ubiquitous. But to understand what numbers mean, traders or investors traditionally dig into every record and look at what each number conveys.

In addition, advances in the open source community with big data tools and systems, such as Hadoop, have brought about a new age in data visualization tools that allow faster and easier data discovery, Komissarov continues. As such, vendors have introduced more dimension than before, with color, shape and even

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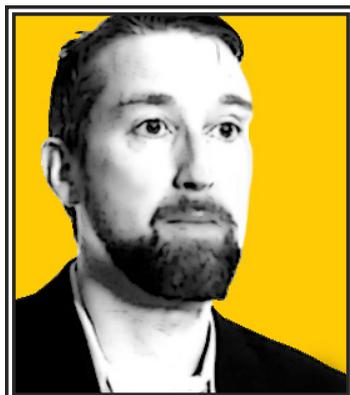


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volume indications. The latest tools combine visualization with 3-D shapes, enabling users to make more intuitive and effective decisions in a much shorter period of time.

Aqumin, for example, has created software called AlphaVision, which enables firms to visualize data on a constantly evolving, interactive landscape — think charts that look like skyscrapers on a landscape that gradually get taller or shorter as data changes in real time. It allows wealth managers, portfolio and risk managers, and even regulators to move things around on the fly and see patterns in disparate sources of public and proprietary market data, according to the company's CEO, Michael J. Zeitlin.

While data visualization is making inroads in the front office, most of the action is still taking place in the back office, according to Peter Wang, founder of Continuum Analytics, which provides tools for large-scale data analysis and visualization, and co-founder of the Py-

Data Consortium, a group of data scientists and developers who use the open source Python programming language for big data analysis.

"At the end of day, most traders are stuck in Excel," says Wang. "In rare cases they'll export and load into another system. But at the end of day in terms of workflow, they're using basic visualizations out of Excel."

The back office is a different story. Faced with petabytes of data to sift through and a limited number of people on staff,

"It's about identifying what's useful and not. It's difficult for humans to process all this information in a way that is effective."

— Chad Cook, Lime Brokerage, discussing visualization

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firms are tapping into the opportunity to create dashboards that can help them focus on which data points are truly important, which in turn enables overburdened IT departments to draw more timely conclusions and maintain a competitive edge.

"Regulations such as Basel III are driving risk reporting and people to operationally understand how compliant they are. And dashboards are where we're seeing that," says Sapient's Forde. "By providing a C-level dashboard, it's helping drive data quality."

Dashboards can tell chief information officers what's going on with their hardware, software and servers and what the impact will be on their business partners if a server goes out, notes Lime Brokerage's Cook.

"The way firms connect with the market involves various protocols like FIX for communications and configurations you rely on to operate with each other. But it's usually not an exact match with what you use internally, which creates a complex environment," Cook says. "Dashboard technology can improve success across all areas of the business for stronger control over an environment that relies heavily on machines."

Still, there's much more to dashboards than pretty visuals. "It's not just about the tool itself. It's about the environment it sits in and how you use it. You have to think that you don't want to apply technology just for technology's sake and some nice visual effects for the next prospective client to look at when they come in," Cook contends.

Dashboards serve an important purpose in today's technology-heavy world, from giving a view of the state of systems, to reporting, compliance, monitoring and control, risk management, and response to problems.

"But for them to be useful we have to look at the types of information we have, who uses it, how we use it and what it means. Then we have a

model to understand the challenges we face when working with that information," Cook says.

Demand for data visualization, particularly on the business side, is also being driven by executives and investors who expect the quality and excitement of iPad and smartphone visuals in even the driest financial software application. Further, Hurricane Sandy, which left thousands of Wall Street employees without power or access to their office, was the ultimate proof that financial professionals need to have the same tools they have on their desktops on their mobile devices.

While it is often said that smartphones and tablets are not a great fit for traders as they are dealing with so much data and mobile screens are too small for the data visualization tools they might need, such devices can enable back-office and operations people to do their work — from trade confirmation to reconciliation, settlement and research in the toughest of circumstances.

Demand for mobile data visualization tools is also being driven by a growing number of wealth management firms that want to make data more interactive on mobile devices, according to DataArt's Komissarov.

"When a wealth management adviser proposes to clients, he doesn't want just to display a diagram in PDF format. He wants to give it as a tool that is interactive on the iPad and be able to change the allocations spread and portfolio without typing it into tables but by using drag and drop, for example," says Alexei Miller, executive VP of DataArt. "And it's now becoming easier to develop advanced tools on your mobile devices." ■



"At the end of day, most traders are stuck in Excel."

— Peter Wang,
PyData
Consortium

How To Select The Most Accurate Data Visualization

Understanding the underlying concerns of data analysis is a good first step for firms looking to more clearly analyze complicated data sets, spot patterns and answer key questions.

By Julie Rodriguez and Francesco Brullo

Today, zettabytes (1 zettabyte equals 1 billion gigabytes) of data are produced every year. In fact, it's projected that in 2014 approximately 7.2 zettabytes of

digital data will be created. With the world's information doubling every two years, understanding large data sets and making intelligent technology and methodology choices are more important than ever. These also remain key challenges. How will companies and users weed through the big data deluge and effectively use it to make better decisions?

In 1786, William Playfair, the inventor of core graphical methods of statistics, stated "When data was less abundant, an understanding of economic structure was both more difficult to formulate and less important for success." He made this observation in the context of increasingly complex eighteenth century commercial life. To help organize, analyze and decipher data, he invented the line, bar, and pie charts. With the amount of data generated today, however, these tools are no longer sufficient.

Visual Transformation

Standalone sets of individual data points can appear meaningless. But data visualization turns data points into graphical representations and imagery that can produce insightful knowledge from big data and bring to the forefront answers to key questions or patterns that enable better decision making. Creating an image of data lets users readily spot, process and develop better insights into data's meaning. In recent years, the ability to create data visualizations has grown in interest across various sectors and become popular in academia, research labs, service and software companies and publications.

While data visualization has been around for centuries, its adoption in the financial markets is relatively new. There are no best practices for creating data visualizations or ways to

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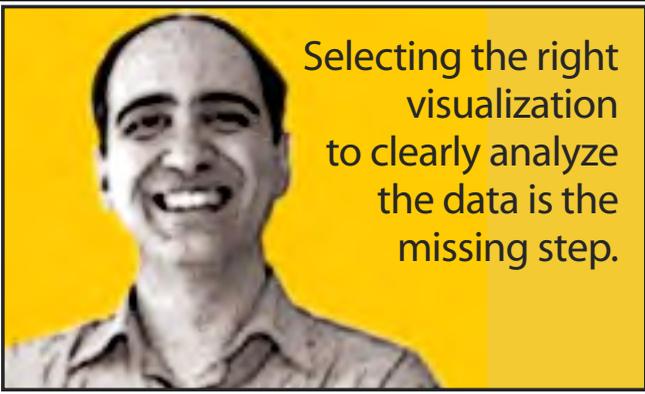
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leverage existing work and limited tools to organize data visualizations. There are online tools, technology and programming languages that categorize data visualizations into types, traits and subject domains. A few of the

available resources are able to establish limited sets of diagramming patterns. However, none of them provide a methodology for selecting the appropriate data visualization for a defined problem. Selecting the right visualization to clearly analyze the data is the missing step in today's technology offerings.



Selecting the right visualization to clearly analyze the data is the missing step.

Analyzing Data

Many businesses recognize that two of their most important assets are their digital data and employees. Yet they often use compromised methods of gathering and transforming data into meaningful and valuable knowledge. For example, they run standardized or ad hoc reports, create proprietary applications of gridded data and use employee resources to manually review and analyze

those reports to then call out any important findings.

Manually analyzing data is time consuming but is often done in order to maintain core business capacity, operational continuity, competitive advantage and compliance. Reviewing stacks of numbers and text is not only error prone but also makes it difficult to analyze data in order to:

1) Develop or assess a hypothesis: Those managing regulatory compliance may need to consider and assess a hypothesis like Hyman Minsky's financial instability hypothesis to protect their firm's future.

2) Discover errors and outliers: From a risk and compliance standpoint, a firm may want to find a way to easily monitor risk exposure across a portfolio on a trade-by-trade basis and manage outliers or trades that are over certain limits.

3) Map trends: From an investment management perspective, a firm may want to track volatility across sectors or industries to capitalize on market opportunity.

4) Create categories: A valuation and risk group may want to know if it can readily quantify exposure to all counterparties by

subsidiaries.

5) Make decisions: A structured products group may want to know if it can create "what if" stress scenarios and decide on optimal product selection.

6) Understand relationships, such as spatial hierarchy and rank: For energy traders, the need may be to determine if a company can manage pipeline operations and portfolio optimization across crude, refined, natural gas and other commodities.

The need to effectively and efficiently address these concerns, individually or in combination, is a challenge for many firms. Following a thoughtfully crafted method to hone the possible visualizations choices is a good way to identify the most appropriate one.

Understanding these underlying concerns introduces the beginnings of a more accurate set of visualizations. The visuals produced let you record, analyze and share data so that it becomes actionable. The data used as an input into the process becomes knowledge that can be leveraged by others, expanded upon and cataloged into a repository to help connect the dots into other similar efforts. ■

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