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2014 Analytics, Bl, and Information Management Survey

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Today's enterprises want less complexity and more user-friendly, visual dashboards. Forty-six percent of respondents say ease-of-use challenges with complex software are among the biggest barriers. Similarly, data visualization tools rated as the most interesting leading-edge technology, with an average 3.5 rating on a 1 to 5 scale.

By Doug Henschen

Report ID: R7531113

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EXECUTIVE

The desire to simplify data analytics and business intelligence has been gaining steam for years. But this year, interest in visual data analysis tools came to the forefront, and the use of Hadoop and NoSQL databases made slow but steady gains. While established companies like IBM, Microsoft, Oracle, SAP and SAS are still the top dogs for BI and analytics, smaller and nimbler vendors like Tableau and QlikTech are forcing the giants to innovate. Of the 248 respondents to our InformationWeek Analytics, Business Intelligence, and Information Management Survey at organizations using or planning to deploy data analytics, business intelligence, or statistical analysis software,

67% are interested in using advanced analytics to improve business operations. Other data points: >> 59% say data quality problems are the biggest barrier to successful analytics or BI initiatives. >> 35% have standardized on one or a few analytics and BI products deployed throughout the company. >> 44% say "predicting customer behavior" is the biggest factor driving interest in big data analysis. >> 47% list "expertise being scarce and expensive" as the primary concern about using big data software. >> 58% list "accessing relevant, timely, or reliable data" as their organization's biggest impediment to success regard-

>> 58% list "accessing relevant, timely, or reliable data" as their organization's biggest impediment to success regarding information management.

In this report, we:

>> Examine how companies such as an advertising behemoth, a university, and a midsize manufacturer have been able to make even elaborate big data analyses as user friendly as possible and get business results.

>> Discuss the ways overwhelmed organizations can push BI and analytics vendors to help simplify reports, dashboards, applications, and data warehouses.

>> Analyze business trends, survey results, and technology developments and offer advice for deploying data analytics and BI strategies.

Respondent breakdown: 60% have 1,000 or more employees; 22% have more than 10,000 employees. Government, education and financial services are well-represented, and 44% are IT director/manager or IT executive management (C-level/VP) level.



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RESEARCH

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Survey Name InformationWeek 2014 Analytics, Business Intelligence, and Information Management Survey

Survey Date October 2013

Region North America

Number of Respondents 312

Purpose To examine adoption trends and strategies around analytics, business intelligence, and information management

Methodology InformationWeek surveyed business technology decision-makers at North American companies. The survey was conducted online, and respondents were recruited via an email invitation containing an embedded link to the survey. The email invitation was sent to qualified InformationWeek subscribers.

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State Of Data Analytics And BI

Whether it's a routine report, an interactive dashboard, or a predictive insight probing vast stores of big data, practitioners paint a consistent picture of the kind of data analysis they're really after these days. Those wonky, sophisticated tools may be fine for the few power users, but what most organizations want is easy-to-use, easy-to-interpret visual analyses that can be shared with executives, salespeople, and other business users preferably on a tablet.

We hear variations on this theme over and over again from practitioners, and the wish list is backed up by our 2014 Information-Week Analytics, Business Intelligence, and Information Management Survey. In fact, the trends identified in this annual tracking survey have been pretty consistent since 2011. Data visualization, for example, has been among the top three most-sought-after "leading-edge" analytics and business intelligence technologies for the last four years, and this year it tied advanced analytics and

embedded BI in the No. 1 spot.

It's no coincidence that visual data analysis is in big demand. That's a response to one of the biggest complaints about BI and analytics tools: complexity. Here, too, our results have been consistent since 2011, with "ease-of-use challenges" ranking second only to "data quality problems" on the list of "barriers to

Analytics and BI Deployment

Figure 1



to deploy data analytics, BI or statistical analysis software

Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

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successful analytics or BI initiatives."

Advanced analytics capabilities remain in high demand, and they're closely associated with big data, as reflected in respondent in-Figure 2

Users Accessing Analytics and BI Tools

terest in predictive analysis, risk analysis, and variable data analysis techniques. Interest in big data is also apparent in the growing use of Hadoop and NoSQL databases, an important information management trend we've been following for more than four years. From midsize manufacturer Multiquip to the massive University of Texas system and on

> to digital ad agency Havas Media and loyalty marketing firm Paytronix, here's a closer look at the seemingly contradictory drive to make even the most sophisticated, big data-encompassing analyses as easy and business-user-friendly as possible.

Moving To Self-Service

To make analytics and BI easier, you really have to start by making it easier to access data. Here, too, our research is consistent, with "accessing relevant, timely, or reliable data" holding steady as the No. 1 impediment to information management success. Analytics and BI vendors know all too well that IT departments are overwhelmed with requests for new

Which of the following users have access to or utilize analytics and BI today? 2013 2014 67% 68% 60% 55% 58% 51% 51% 50% 43% 46% **C-level corporate executives (including VPs) 40% 40%** 40% 18% 26% 25% external suppliers and partners **Data analysts or data scientists** Every employee and partner ne-of-business managers Customer service reps (nowledge workers inancial managers 13% **Business analysts** management l employees 9% **6**% sales force Customers 1% R7531113/2

Note: Multiple responses allowed

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: Information Week Analytics, Business Intelligence and Information Management Survey of business technology professionals

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data sources and new dimensions of data that require changes to reports and dashboards or, worse, changes to applications and data warehouses. It's no wonder that "self-service" capabilities seem to be showing up in every BI software upgrade.

Several years ago, QlikTech and Tableau Software became synonymous with self-service, an appealing trait that has helped propel double-digit growth for both companies. Larger BI incumbents including Microsoft (with PowerPivot and Power View), Oracle (with Endeca), and SAP BusinessObjects (with Lumira) have been playing catch-up, adding data discovery add-on modules and options. New tools typically expose trusted, ITcontrolled data sources — like data warehouses, data marts, and operational data stores — through drop-down menus or data catalogues. Users point-and-click or drag-anddrop the data they wish to analyze.

The very latest announcements in this vein include the NEO project at IBM Cognos and MicroStrategy data-blending capabilities. The most flexible products also let you add in local

Figure 3

Extent of Technology Use

To what extent are the following technologies used to share analytic and BI insights within your organization?

Used extensively Used on a lim	ited basis Planned use	No current/planned use					
Spreadsheets							
66%			22%		9% 3%		
Reports (formatted PDF or HTML ser	nt by email or accessed online))					
529	%		34%		10%	4%	
Dashboards (interactive data visual	ization interfaces)						
34%		41 %		19 %		6 %	
Query and analysis software (e.g., ir	n-memory what-if planning, 0	LAP cubes, etc.)					
28%	37%	37%		20%		15%	
Scorecards (comparing performance	e to predefined goals)						
27%	37%	37%		24 %		12%	
Alerts (email, SMS, etc., for exceptio	ons and thresholds)						
25%	39%	39%			16%		
Embedded BI (data visualizations w	ithin business apps or portals))					
15%	40%	40%			18%		
Predictive analytic apps or data visu	alizations						
12%	35%	5% 30%			23%		
Mobile (smartphone- or tablet-base	d) dashboards or data visualiz	ations					
10% _25%		39%		26%			
				20			

Base: 248 respondents at organizations using or planning to deploy data analytics, BI or statistical analysis software R7531113/3 Data: InformationWeek 2014 Analytics, Business Intelligence and Information Management Survey of 312 business technology professionals, October 2013



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spreadsheets or third-party data sets, such as government economic data sets or enrichment data from the likes of Dun & Bradstreet or Experian. With these new tools, business users typically don't have to worry about data mapping or data transformation steps that used to require IT assistance; that job is now handled by smart software that operates behind the scenes.

Construction equipment manufacturer Multiquip, a midsize firm based in Carson, Calif., shares a pretty typical account of the need for self-service: "We were looking for a way to serve the end users better, faster, and more efficiently without always having to get IT involved," explains Michael Hanken, Multiquip's VP of IT.

Multiquip built a Microsoft SQL Serverbased data warehouse four years ago, and it added Logi Analytics, a BI suite aimed at midsize companies, to handle its reporting, dashboarding, and ad hoc query needs. To make insights more accessible, the company used Logi's software to roll out iPad-based reports and a sales-oriented price-quoting application last year. That still didn't fulfill what Hanken describes as "the IT manager's dream: reports written entirely by end users." Figure 4

To fill this gap, Multiquip signed on as a beta customer for Logi Vision, which is Logi's answer to meeting self-service and data-visual-



Technologies Used to Share Analytic and BI Insights

Note: Multiple responses allowed

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Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis sc Data: *InformationWeek* Analytics, Business Intelligence and Information Management Survey of business technology professionals

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ization demands. Multiquip added the software in September, and in a pilot deployment it's exploring ways to let users solve customer-service problems on their own when, say, a big shipment of replacement parts doesn't show up on time.

"When there are delays, there's a ripple effect on the supply chain and customer service, and that's not something that shows up in a daily report or single pie chart," Hanken says.

Data exploration and visualization tools can't just serve up pretty charts and graphs. They must make it easy for business users to explore and correlate multiple dimensions of data. Multiquip's standard supply chain reports, for example, don't include sales data that shows which important customers might be hard hit by a particular shipping delay. The Department of Defense, one big customer, has Multiquip light towers stationed at multiple military bases in Afghanistan. And then there are large equipment-rental companies — big Multiquip customers that have to keep major highway construction projects working through the night. Which customer do you serve first? "Now we have all this information in the Logi Vision data layer, and users can query

Figure 5

the supply chain side and purchasing data and see the effect on the sales side," Hanken says. "That's something we didn't have be-



Base: 248 respondents at organizations using or planning to deploy data analytics, BI or statistical analysis software R7531113/5 Data: Information Week 2014 Analytics, Business Intelligence and Information Management Survey of 312 business technology professionals, October 2013

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fore, and they can do it on their own without asking IT to create a new report."

As with many of the other modules and up-Figure 6

Current or Planned Use of Analytics and BI

dates in this vein, data selection is a drag-anddrop proposition with Logi Vision, and the software automatically chooses the data visualization scheme that fits best based on the data and style of analysis. Multiquip has 11 people in its IT department, and Hanken says

> that any time saved by the one IT person who supports the Logi software will be channeled toward bringing the Vision data exploration applications to the iPad.

> "We were skeptical about the iPad deployment because field salespeople are tough to please, but I have to say it was a stunning success," he says. "We gave them two hours of training and they just took it away."

Putting Data In Context

Salespeople might be tough critics, but Stephanie Huie can top Hanken on serving demanding BI and analytics consumers.

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Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: *InformationWeek* Analytics, Business Intelligence and Information Management Survey of business technology professionals

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The vice chancellor for strategic initiatives at the University of Texas System, Huie spearheaded the creation of a UT System Productivity Dashboard that's used by everybody from the system's chancellor and board of regents to the Texas Legislature, the press,

and the public.

Accessible at https://data.utsystem.edu, the UT Dashboard includes 10 high-priority success indicators across the system, which includes nine universities and six health institutions. The dashboards offer drill-down details on each institution regarding enrollments, degrees awarded, graduation rates, healthcare-related degrees, faculty productivity, research expenditures, revenue from intellectual property, patient care revenues, expenses, and endowments. All of the dashboards report on historical data, but many also include projections of future performance — a key differentiator between BI and advanced analytics.

UT's dashboards have been a work in progress, starting with the launch of a data warehouse project and the initial dashboard design in 2011 to the implementation of SAS Visual Analytics software and related iPad support early this year.

UT has used SAS statistical software for years for predictive analyses of important metrics, including enrollments, graduation

Figure 7



Note: Multiple responses allowed

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

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rates, tuition, and revenue. But an efficient, centralized approach and visual analyses were essential to delivering greater trans-Figure 8

parency to UT constituents. The data warehouse brought a trusted and consistent data source, while drillable dashboards were

added to share data with the world.

UT initially delivered its dashboards using SAS's standard BI software, but when SAS added its Visual Analytics module last year, UT quickly added that software.

"The reason we went to Visual Analytics, frankly, was that we wanted the iPad app," Huie admits. "SAS BI is great, but it's Flash, so it doesn't work with iPads, and that's what our regents and a lot of our internal constituents want to use."

Another difference between the conventional dashboards and more modern visual software, says Huie, is the ability to put data in context. A report on student debt, for example, shows the average debt among students graduating from each UT school, and these levels are visually compared with averages statewide and across the US.

Context is also provided in visual comparisons of UT schools to two sets of peers: schools with matching performance characteristics and "aspirational peers." UT uses the latter to

Interest in Analytics and Business Intelligence Technologies

Please rate the level of interest within your organization in the following leading-edge analytics or BI technologies. Please use a scale of 1 to 5, where 1 is "not interested" and 5 is "extremely interested."



Note: Mean average ratings

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

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set performance goals for 2015 and 2025. This is an area where predictive capabilities come into play because planners can project

outcomes and set realistic goals.

Analytics Without Ph.D.s

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Figure 9

Factors Driving Interest in Advanced Analytics

What factors are driving, or would drive, your organization's interest in using advanced analytics?



Note: Multiple responses allowed

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software

Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

Our survey respondents have clear and consistent ideas about what advanced analytics can do for their companies. Top factors driving interest include "optimizing business operations," "identifying business risks," and "forecasting financial or operational results" (see Figure 9). These factors describe many of the analyses being carried out at UT, but its model of deployment is in the producer-consumer mold — data experts do the analyses, and lesser-skilled business users consume the results.

As the name suggests, producing "advanced" analytics has mostly been the domain of statisticians, data miners, and data analysts. (These people may have adopted the label "data scientist," but this label is more often used by advanced mathematicians and datasavvy developers employed by R&D labs and Internet giants. They more typically code up their own algorithms from scratch for bespoke applications rather than relying on commercial tools.) But the desire for easier-touse software and self-service is also showing up in this high end of the market.

In one of its "Wave" reports published in early 2013 on the topic of "Big Data Predictive Analytics," analyst firm Forrester encouraged analytics incumbents including SAS and IBM SPSS (the top two analytics vendors by sales) to make their software more accessible to nontechnical users and ready to use "out of the box." Forrester pointed to a crop of relatively new analytics vendors, including Alpine Data Labs, Alteryx, and Rage Frameworks, for work on creating abstracted, business-useroriented interfaces and the use of automation techniques. The idea is to minimize the complex workflows and iterative testing involved

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in advanced analytics work.

KXEN, another vendor in this mold, in September agreed to be acquired by SAP. KXEN automates many aspects of prediction so lineof-business users can make forward-looking decisions. Its software and cloud services are deployed in predictive customer acquisition, cross-sell and up-sell, retention, and next-bestoffer applications. SAP said it will incorporate the technology into cloud and on-premises applications such as fraud management, smart-meter monitoring, and CRM.

Business-user-friendly advanced analytics and self-service-capable BI were both on the wish list at Havas Media Group, a digital advertising and marketing company with more than 50 ad agency offices around the globe. Like Multiquip, Havas had a BI deployment that was too dependent on IT. And like the University of Texas, the firm was developing advanced analytics in an inefficient, decentralized way. Before it could even get to these problems, the company recognized in 2010 that its aging Oracle data warehouse was running out of room.

Havas's search for a new data platform concluded with the selection of the Greenplum database (now offered by EMC spinoff Figure 10

Pivotal) — opened the door to a transformation of the company's BI and analytics approach. The launch of the production environ-

Factors Driving Interest in Big Data Analysis



Note: Multiple responses allowed

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software

Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

FAST FACT

of this year's Analytics, BL and Information Management Survey respondents involved with information management say they're using NoSQL.

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ment is still underway, but the enterprisestandard analytics and BI product selections have been made, according to Sylvain Le Borgne, the company's London-based executive VP of data platforms.

Havas's migration to Greenplum naturally turned a fresh eye to the closely related BI deployment, and in 2012 Havas determined it would move away from MicroStrategy in favor of Tableau Software. "Our idea is to give more understanding and control to the end users, and Tableau is giving them that," says Le Borgne. "They can build anything with Tableau, publish it, and connect it to data in real time."

The Greenplum-based warehouse is a key data source for Havas, and it holds a wealth of information about advertising. Havas's specialty is digital advertising, so the information starts with deep histories on ads served, on which websites and networks, what size, what time of day, which creative, which response information, and so on.

Havas also tracks email, social, and "offline" advertising, including TV, radio, and billboard campaigns. Offline advertising is increasingly measurable, with set-top-box data available for TV and foot-traffic and automotive-traffic sensor data available for some digital billboards. Figure 11

Seeking A Common Language

To measure the effectiveness of advertising campaigns, Havas compares ad delivery and



Note: Multiple responses allowed

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software

Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

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response data to aggregated (non-personally identifiable) customer data from CRM systems. Big banks and airlines, for instance, want to spend their ad dollars efficiently, so they're willing to share some data to help Havas improve ad targeting.

"They don't want to give us exactly the numbers, but they'll tell us, 'This client is gold, this client is silver, this one is platinum, and this one is bronze,' " Le Borgne explains. "They can pass us just the scores so we can then figure out which kind of campaign works best with which kind of customer." (Cookies are often the connection point between ad responders and purchasers and particular customer segments.)

BI handles the task of historical reporting on which customer segments responded to which ads on which sites. When it comes to forwardlooking campaign planning, or scoring of customers or websites for future campaigns, that's the province of advanced analytics.

The problem with Havas' analytics approach was that it was carried out mostly by engineers (Le Borgne calls them data scientists) in

Figure 12



Base: 248 respondents at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: *InformationWeek* 2014 Analytics, Business Intelligence and Information Management Survey of 312 business technology professionals, October 2013

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distributed locations using aging SAS desktop software. The analytics methods weren't easily shared with analysts in other offices, much less

turned into repeatable processes. Worse, the work was iterative, time-consuming, and stuck on laptops, so it was far from collaborative.

"The account teams saw the inputs and the outputs, but without any understanding of the analysis in the middle," says Le Borgne.

In a typical scenario, Havas might want to score a website to see whether it's a productive place to run advertising. The account team would specify certain thresholds around, say, traffic levels or clickthroughs, but the analysis was then in the hands of the data scientist.

"If we didn't set the right thresholds at the beginning of the process, account teams then had to figure out what went wrong if the output wasn't what they wanted, and they had to be able to express that to the engineer, who would change the setting or the algorithm and run the analysis again."

Havas had a choice of more modern, serverbased analytics platforms that would address these drawbacks (including options from SAS), but it opted for a beta release of Alpine Data Labs software that offered a highly visual and collaborative workflow that opened up the analysis steps to business users.

"Now account team members can just log

Figure 13



Note: Multiple responses allowed

Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: InformationWeek Analytics, Business Intelligence and Information Management Survey of business technology professionals

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in to the platform, see the data flow, and change the thresholds themselves," says Le Borgne. "We can also split the workflows into very simple steps, and users can play with an algorithm and ask questions." Havas started testing the software (recently

Figure 14

management?

Impediments to Information Management Success With your organization's experience in mind, what are the biggest impediments to success related to information

2013 **58**% **58**% ntegrating data (e.g., extract, transform, load or data federation) Aaintaining reliable and responsive data marts and warehouses oping with rapidly increasing volumes of data and/or content Reducing data latency and supporting faster decision-making Jrganizing and maintaining data models and/or taxonomies 47% 48% 44% 44% 44% extracting data or transactional information from Accessing or managing content such as Word files, leansing, deduping or ensuring consistent data 。 36% 35% Accessing relevant, timely or reliable data m Processing high-velocity data streams e.g., financial trade or shipping data) 27% 26% aper-based forms and documents email messages and presentations 26% 25% 242 **12**% **12**% **4**% 4% Other R7531113/14 Note: Multiple responses allowed

Base: 298 respondents in October 2013 and 517 in October 2012 involved with information management technologies Data: *InformationWeek* Analytics, Business Intelligence and Information Management Survey of business technology professionals released as Alpine 3.0) in February 2013, and it's now moving into wide-scale production deployment. Where the data scientists were previously treated more like "mad scientists who were never questioned," Le Borgne says the visual workflow provides "a common language in the middle" that lets account teams and data analysts work together and "move forward faster."

Hadoop, NoSQL Slowly Gain Ground

Given all the buzz around big data, you'd think that every organization is experimenting with Hadoop and NoSQL databases, but that's not the case. Our survey suggests these platforms are seeing moderate growth and are still used by less than 20% of enterprises.

In our 2012 survey (published in late 2011), 14% of our respondents said they were using "Hadoop or other nonrelational ('NoSQL') processing

FAST FACT

67% of respondents at organizations using or planning to deploy data analytics, BI, or statistical analysis software are interested in using advanced analytics to improve operations.





Figure 15



Base: 298 respondents involved with information management technologies Data: *InformationWeek* 2014 Analytics, Business Intelligence and Information Management Survey of 312 business technology professionals, October 2013 platforms." In 2013 that figure rose to 17%. Our 2014 results aren't comparable to prior-year data because we split out the platforms, but 19% of this year's 298 respondents involved with information management say they're using NoSQL and 15% say they're using Hadoop.

Why is adoption of these platforms growing? Despite the emphasis on the "big" in big data, it's also the ability to deal with variable and fast-changing data that has many companies adopting NoSQL and Hadoop. Loyalty marketing company Paytronix is a case in point.

Paytronix collects data from more than 8,000 restaurants to help chains like Panera, Papa Gino's, and Outback Steakhouse optimize their marketing and loyalty programs. The company's incumbent Microsoft SQL Server-based data warehouse contains only tens of terabytes, not the petabytes many associate with big data. Nonetheless, Paytronix is a fervent new user of NoSQL and Hadoop.

"We're bringing back data from many

R7531113/15

different restaurant chains, and their databases all look different," says Paytronix's president and founder, Andrew Robbins. "We've held daylong meetings going through these different structures saying, 'Can we put it all in a relational database?' But for every field of data there seem to be exceptions and problems." Exceptions and problems require changes to the data model, and then you get into changes in extract, transform, and load.

With Hadoop and NoSQL, you load data and create the schema on read rather than defining a data model in advance. The promise of flexibility led Paytronix to start experimenting with both MongoDB and Hadoop in June 2012. After a bit of experimentation, Robbins says Paytronix has settled on a three-headed data management strategy.

Paytronix uses MongoDB to store all creative assets, including all the marketing materials; configuration information; and campaign-related ads, logos, and other content in various formats related to indi-

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vidual brands and their customer loyalty programs. This is the stuff that populates the various web, mobile, Facebook, and other digital presences that Paytronix manages and that customers encounter when they go to sign up for a customer loyalty program. The second part of the Paytronix data management strategy is the relational databases that will continue to run its transactional sys-

Figure 16



Base: 298 respondents in October 2013 and 517 in October 2012 involved with information management technologies Data: *InformationWeek* Analytics, Business Intelligence and Information Management Survey of business technology professionals tems and the data warehouse. The transaction systems handle all the loyalty interactions when customers pay their bills — verifying the account, delivering any discount or reward offer, and logging the latest meal to the account history. The data warehouse is for standardized reports on structured data that's consistent across all restaurants. This covers most of the daily point-of-sale and check-level detail from each chain and location, but a lot of valuable information wasn't used because it didn't fit neatly or easily into the warehouse.

Hadoop is the third leg of Paytronix's data strategy, han-

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dling extended gueries on a richer set of data. Because of the variations from chain to chain, for example, the data warehouse contained only aggregated data by category, such as appetizer, pasta, and desert. You couldn't drill down to see details such as apple pie versus strawberry shortcake versus chocolate cake. And forget about modifiers such as "medium rare" or "hold the onions" or "substitute potato with rice."

With Hadoop, Paytronix can now store all check-level detail from every restaurant, yet it doesn't have to worry about schemas. Using the R language, MapReduce processing, and Hive queries, it can develop a finer-grained understanding for customer behavior and restaurant performance. If it finds something of value, Paytronix can move boiled-down data sets from Hadoop into the data warehouse, where Pentaho BI tools are used for the reporting, ad hoc query, and analysis.

When enrolling customers in loyalty programs, many chains don't like to pester them for personal details, yet these demographics relate to customer behaviors that restaura-

Figure 17

Factors Driving Interest in Hadoop

What factors are driving, or would drive, your organization's interest in using Hadoop?



Note: Multiple responses allowed

Base: 298 respondents involved with information management technologies

Data: InformationWeek 2014 Analytics, Business Intelligence and Information Management Survey of 312 business technology professionals, October 2013

teurs can use to their advantage. Children, for example, are an important trigger for restaurant dining. But parents don't always tell you that they are parents even if asked on a loyalty enrollment. What's more, older people may not have children in their households, but that doesn't mean they don't take their grandchildren out to dinner.

Using Hadoop, Paytronix is spotting loyalty club members who are dining early and ordering items such as kids' entrees and milk as a beverage. These are telltale signs that chil-

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dren are among the guests. These customers can then be targeted with child-related promotions and discount offers that can give restaurants a big boost in business.

Paytronix also used Hadoop to spot coupon fraud patterns that were tied to specific waiters and waitresses gaming the system. It's also working on an even bigger challenge: spotting millennial-generation customers that restaurants need to attract now that baby boomers are aging out of the customer ranks.

To find young people, Paytronix looks for patterns such as large groups coming in on weekdays after work hours and ordering lots of drinks and appetizers. Lots of restaurants are also dreaming up social promotions whereby you can log in with Facebook to buy gifts for friends or give to charities. Social data that can be examined in Hadoop opens up a whole new window on behavioral information, according to Robbins.

"If we have a Facebook account, we can find out what they like, and it turns out the things people like tell you how old they are," he says.

Figure 18

Factors Driving Interest in NoSQL Databases

What factors are driving, or would drive, your organization's interest in using NoSQL databases?

Ability to deal with variable data and fast-changing data models

 31%

 Interest in simpler or easier management than possible with relational databases

 26%

 Interest in faster, more flexible development than achievable with relational databases

 21%

 Ability to manage high-scale Web and mobile applications

 20%

 Lower hardware and storage scaling cost than commercial products

 19%

 Lower software and deployment cost than commercial products

 17%

 Other

 1%

 NoSQL databases are not a priority for my organization

Note: Multiple responses allowed

Base: 298 respondents involved with information management technologies

Data: InformationWeek 2014 Analytics, Business Intelligence and Information Management Survey of 312 business technology professionals, October 2013

"The music that you like, for example, is generally the music that you listened to in high school and college."

These are just a few real-world examples of

why information management is moving beyond databases. It's not that the old platforms are going away, but our survey respondents have made it clear that for exploring click-

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streams, social data, sensor data, and rich and variable information, new platforms are helping to unlock latent insights.

Getting To Better BI And Analytics

Innovators have a way of making things better for everybody, but that doesn't mean you should rush from one hot new vendor to the next. Good ideas and approaches spread fast, and we've seen waves of upgrades in recent years delivering self-service capabilities and data exploration and data visualization interfaces. But before you ditch that yearslong investment in software and training, make sure you've at least considered the options from your incumbent vendor(s). There are times when the breadth, depth, and industry experience of incumbent vendors make a big difference.

But how can you tell a truly up-to-date product from a pale imitation of innovation?

On the data visualization front, Forrester analysts Boris Evelson and Noel Yuhanna have identified six traits that separate advanced data visualization from static graphing: dynamic data, visual querying, linked multidimensional visualization, animation, personalization, and actionable alerts. Dynamic data support allows visualizations to update as the data changes in source databases. Visual querying lets you change what's analyzed by clicking on a portion of a chart or graph. Multidimensional linking ensures that selections made in one chart are reflected as you navigate into other charts. Personalization lets you offer an in-depth view to power users and a simplified view to newbies. Alerts let you set parameters that trigger messages when there's an important exception or condition.

As for those self-service capabilities and easy-to-use analytics, check out the comments on user group and vendor community boards. Also check out the customer reviews at G2 Crowd and in-depth professional reviews at BI Scorecard. If you're a Forrester or Gartner customer you can also tap Wave and Magic Quadrant reports for research and schedule time with an analyst to discuss your needs. By all means, go to company events and talk to customers who have implemented the upgrades you're considering.

The good news is that it's very clear what BI and analytics customers want, and they are voting with their wallets. If your incumbent vendor isn't making life easier for you and your business users, maybe it's time for a pilot project with a different vendor.





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Figure 19

Job Title

Which of the following best describes your job title?



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Figure 20



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Figure 21



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Figure 22



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Figure 23



Base: 248 respondents in October 2013 and 417 in October 2012 at organizations using or planning to deploy data analytics, BI or statistical analysis software Data: *InformationWeek* Analytics, Business Intelligence and Information Management Survey of business technology professionals



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