

Big Data Use Cases

Getting real on data monetization

2015

BARC Research Study

Authors



Dr. Carsten Bange
Managing Director
cbange@barc.de



Timm Grosser
Senior Analyst
tgrosser@barc.de



Nikolai Janoschek
Research Analyst
njanoschek@barc.de

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Big data: There is no getting around it

Big data has made its way into the business world. This was confirmed as a central finding of “Big Data Analytics”, a BARC study from 2014 that examined the development of big data in Germany, Austria and Switzerland. Back then, almost a third of participating companies stated that they had firmly integrated or were in the process of integrating big data analyses into their business processes.

Awareness of big data continues to grow strong – especially with regard to digitalization initiatives. The wave of big data has reached every corner of businesses today. In other words, big data is revolutionizing the way companies identify new business models and define their advantages over competitors.

Despite the euphoria, are we really on the verge of a new data-driven era? Are companies really faster, more productive, efficient and innovative because they use big data? Does this picture even somewhat reflect the day-to-day reality within companies? And if so, what exactly are companies doing to benefit from big data?

To answer these and other questions, the following study will examine big data use cases as well as the technological, organizational and business settings in these companies. The survey centers on the following questions:

- Which business departments use and initiate big data analyses?
- How do they use big data?
- What advantages do companies gain through big data analysis?
- What common business and technical problems do they face?
- How do companies finance big data projects and what level of return of investment (ROI) do they achieve?
- Which technologies do they use or plan to use in the future for big data scenarios?

BARC has independently conducted and written this study. It is available to readers at no cost thanks to sponsorship from Blue Yonder, Cloudera, Hewlett-Packard, Information Builders, pmOne, SAS, Tableau and Teradata.

BARC would also like to thank all participants of its future surveys in advance. Through this vital support, we can fuel further discussions with insights based on empirical data.

Würzburg, Germany. 22th July 2015.

Dr. Carsten Bange, Timm Grosser,
Nikolai Janoschek

Management summary

Big data is a topic that companies can no longer ignore – that is, if they want to maintain their competitive edge in a business world that is changing faster than ever. From making more efficient processes and better strategic decisions to more precise forecasts and new business models, the benefits of using data more effectively are well known across today's organizations.

But how well do enterprises utilize these potential advantages? To find this out, this study examines the current status and future developments of big data and its use cases. With more than 550 participants from a wide range of industries worldwide, "Big Data Use Cases 2015" is one of the largest studies focusing on the conditions and use cases of big data analyses. We have summarized the main findings of this study into six hot spots.

Hot spot 1

Big data is taking enterprises by storm (but only when management takes the lead)

Big data is increasingly prevalent in today's enterprises. Relatively few companies worldwide (17 percent) would not even consider starting a big data initiative. Over 40 percent already have experience with big data, whether as an integrated part of their business processes or as a pilot project.

This development reflects the wide range of challenges that organizations want to address through their big data initiatives. Companies who would at least consider a big data initiative most frequently cited analyses of large data volumes (57 percent), analyses of different sources (50 percent), faster and better analyses

(55 percent), and more sophisticated forecast methods (51 percent) as the underlying reasons.

Whether or not big data initiatives thrive in companies depends heavily on their management. In companies where big data initiatives are an integrated part of business processes, management is the main driver or thought leader. However, that is only the case 34 percent of the time in companies where such an initiative is only conceivable in the future. As a whole, business departments are still very passive and much less likely to be the drivers behind this topic.

Hot spot 2

Big data initiatives yield considerable benefits

Companies with big data initiatives report considerable advantages. Topping the list are better strategic decisions (69 percent), improved control of operational processes (54 percent), better understanding of customers (52 percent) and cost reductions (47 percent). Companies

able to gauge those benefits in numbers reported, on average, an eight percent increase in revenues and a ten percent reduction of costs. In addition, these projects not only met the companies' high expectations prior to the project, but exceeded them in many cases.

Hot spot 3

The customer is king

Companies are utilizing big data analyses in many different areas. Participants were asked to reveal their specific use cases. Among their responses, the word "customer" stood out the most by far. Enterprises no longer want customer desires, motives, needs and behavior to be an unknown. Big data initiatives help build a complete picture of the customer by making each interaction with the company transparent. In order for this to work, enterprises must take the data from many different isolated customer contact points, pool it together within a big data project, and make it ready to analyze. By creating a complete picture, they can address their customers more personally and in a more targeted manner, reduce churn, and win new customers.

"Big data initiatives help build a complete picture of the customer by making each interaction with the company transparent."

Correspondingly, marketing and sales are the forerunners in big data. Among the companies that could at least conceive of using big data analyses, marketing (25 percent) and sales (23 percent) have already integrated big data analyses in their evaluations. Nonetheless, the survey reported plenty of big data use cases in all

other departments including production, finance/ controlling and human resources. The unusually high numbers for planned deployments by department (between 34 and 56 percent overall) speak for themselves. Sooner or later,

big data will reach every corner of the business – even if 38 percent of respondents are still searching for compelling use cases.

Hot spot 4

Companies are struggling with data privacy, data security and inadequate skillsets

Aside from the lack of compelling use cases, data privacy, security and a shortage of big data expertise are major problems that enterprises face when dealing with big data. 49 percent of respondents named data privacy and 48 percent cited data security among their biggest problems in using big data technologies. Since many business cases center on customers, organizations need to take special care in protecting their data. In addition to anonymizing data sufficiently, companies also have to secure this data

“As the use of big data analysis spreads, the complexity of the technological infrastructure tends to grow as well. Securing both this infrastructure and its data is a central challenge for companies.”

from outside attacks. As the use of big data analysis spreads, the complexity of the technological infrastructure tends to grow as well. Securing both this infrastructure and its data is a central challenge for companies.

The second main issue is the lack of internal business and technical know-how for tapping and analyzing big data. 53 percent of respondents cited a lack of analytical know-how while 48 percent reported a lack of technical expertise in their organizations. 30 percent of companies with big data projects, therefore, want to create new jobs in these areas. The global labor market, however, currently cannot meet their demand for this type of expertise.

Hot spot 5

Europe is lagging behind

There are clear differences in the usage of big data between North America and Europe. Our study confirms the theory that North American companies are significantly further ahead in their initiatives than their European competitors. 28 percent of the North American companies responding to the survey have already integrated big data initiatives into their business processes. If we include companies with pilot projects, more than half of North American companies already have hands-on experience with big data. In contrast, only 16 percent of European companies stated that big data is integrated in their business processes, and only 39 percent have practical experience. European companies are clearly lagging behind.

Nonetheless, companies on both sides of the Atlantic are struggling with very similar problems – especially with regard to the lack of technical and business skills. Contrary to the notion that data privacy has less importance in North America than in Europe, the study shows that respondents from both regions view data privacy as a problem in projects (50 percent in North America compared to 49 percent in Europe). In North America, data security even ranked as a much bigger problem (56 percent compared to 46 percent in Europe).

Hot spot 6

Industry 4.0 is more of a dream than reality

The use of big data varies greatly by industry. While retail has secured a leading position with 27 percent, only 13 percent of companies in manufacturing reported using big data analyses in their business processes. The much-discussed topic of Industry 4.0, which focuses on the digitalization of production and logistics processes, is only making small advancements in the area of big data. Nevertheless, it does appear that the discussion is slowly beginning to provoke a change in thinking. With 24 percent, companies in manufacturing had the highest ranking for pilot projects. The lack of big data experience appears to be slowing down this progress. In fact, 63 percent reported problems with insufficient business skills while 61 percent cited inadequate technical know-how. Manufac-

turing and its major project Industry 4.0, therefore, are running into serious danger of getting stuck in the starting blocks.

Expectations for big data differ by industry as well. Retailers hope to increase customer insights (85 percent), better steer operational processes (77 percent) and increase revenues (65 percent). Manufacturing, in comparison, has above-average expectations to better steer operational processes (66 percent) and reduce costs (43 percent). The finance sector primarily wants to use big data analyses to develop new product ideas and services (52 percent).

“Manufacturing and its major project Industry 4.0 are running into serious danger of getting stuck in the starting blocks.”

Survey findings

Big data is a cornerstone of the transition to a digitalized economy. However it is still a relatively new topic with many aspects in a state of flux. It is not always clear if companies truly use big data or if it is simply wishful thinking. Many still appear to be searching for real possibilities to utilize big data in their business.

To shed light on this topic, this empirical study focuses on big data use cases and the accompanying technical,

organizational and business conditions. It first examines how widespread big data analyses are and what benefits companies actually achieve with their support (see chapters "*More and more enterprises are using big data*" and "*Big data benefits exceed expectations*"). This study also shows how and where companies generate these benefits – specifically, which departments use big data in which scenarios (see

"It is not always clear if companies truly use big data or if it is simply wishful thinking."

chapter "*Big data initiatives are on the rise across the enterprise*"). The chapter "*Companies still heavily rely on standard BI tools, but change is in the air*" discusses the technological conditions, in particular which technologies and types of data companies currently use for big data. The study also addresses how companies

are financing these initiatives (see chapter "*Big data is a job engine*") and shows the common pitfalls they face when dealing with big data (see chapter "*Insufficient skills are curbing the big data boom*").

To ensure that all survey participants had a common understanding of big data, we used the following BARC definition as the starting point for categorizing and evaluating big data initiatives:

Big data
describes the methods and technologies for the highly scalable loading, storage and analysis of polystructured data.

Big data technology can help companies to manage large data volumes, complex analysis and real-time integration of data from a variety of data structures and sources.

Figure 1: BARC definition of big data

More and more enterprises are using big data

Enterprises today are aware of the value locked within their data. This was one of the key findings of “[Datenmanagement im Wandel](#)“, a 2014 study that BARC conducted in Germany, Austria and Switzerland. The results of this latest BARC study indicate that companies are increasingly aligning their actions in decision-

making processes to the growing significance of data (Figure 2). Almost two-thirds of all responding companies stated that data and analysis form the basis of decision-making throughout their organizations. Only twelve percent reported that their decision-makers primarily make decisions based on their own experience.

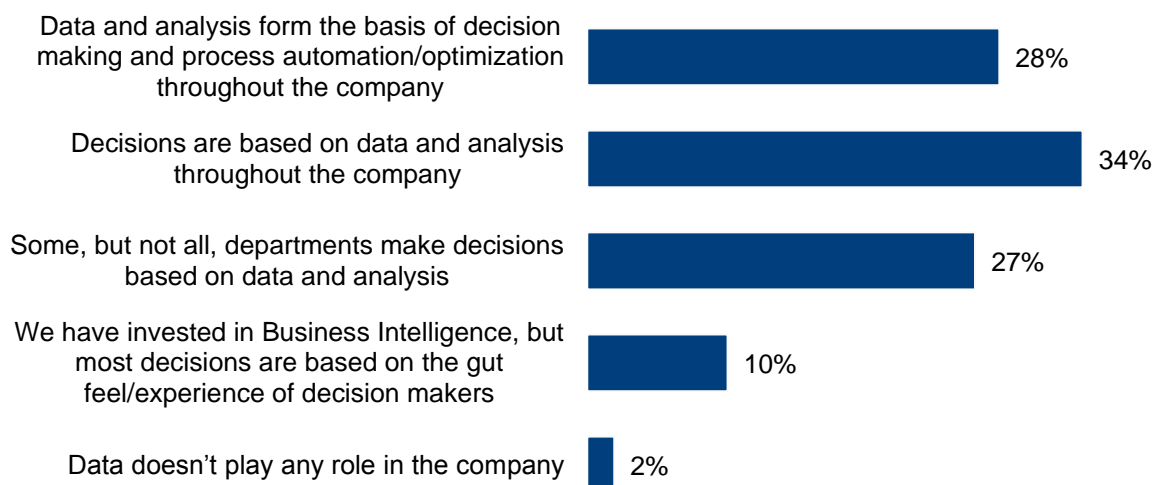


Figure 2: What role does data play in your company? (n=543)

The current status of big data initiatives reflects the growing significance of data in companies. Figure 3 shows that over 40 percent of companies are currently implementing big data initiatives – either as part of their business processes or as pilot projects. Only 17 percent are currently not considering a big data initiative.

This survey confirms the common perception that North American companies are more advanced than their European competitors when it comes to big data.

perception that North American companies are more advanced than their European competitors when it comes to big data. 28 percent of

Although big data has made its way into companies as a whole, there are still major differences by both region and industry. This survey, for example, confirms the common per-

cept that North American companies have already integrated big data into their business processes and more than half already have a big data initiative. In Europe, this is only the case in 16 and 39 percent of companies respectively.

Furthermore, this study also shows differences between industries. The much-discussed topic of Industry 4.0 appears to be stagnating – at least from a big data standpoint. Only 13 percent of the companies in manufacturing use big data analysis in everyday business, compared to 27 percent of retail companies. However, manufacturing also has the highest ranking for pilot projects with 24 percent. This indicates that the intense discussions around Industry 4.0 are slowly having an impact and the situation will change in the near future.

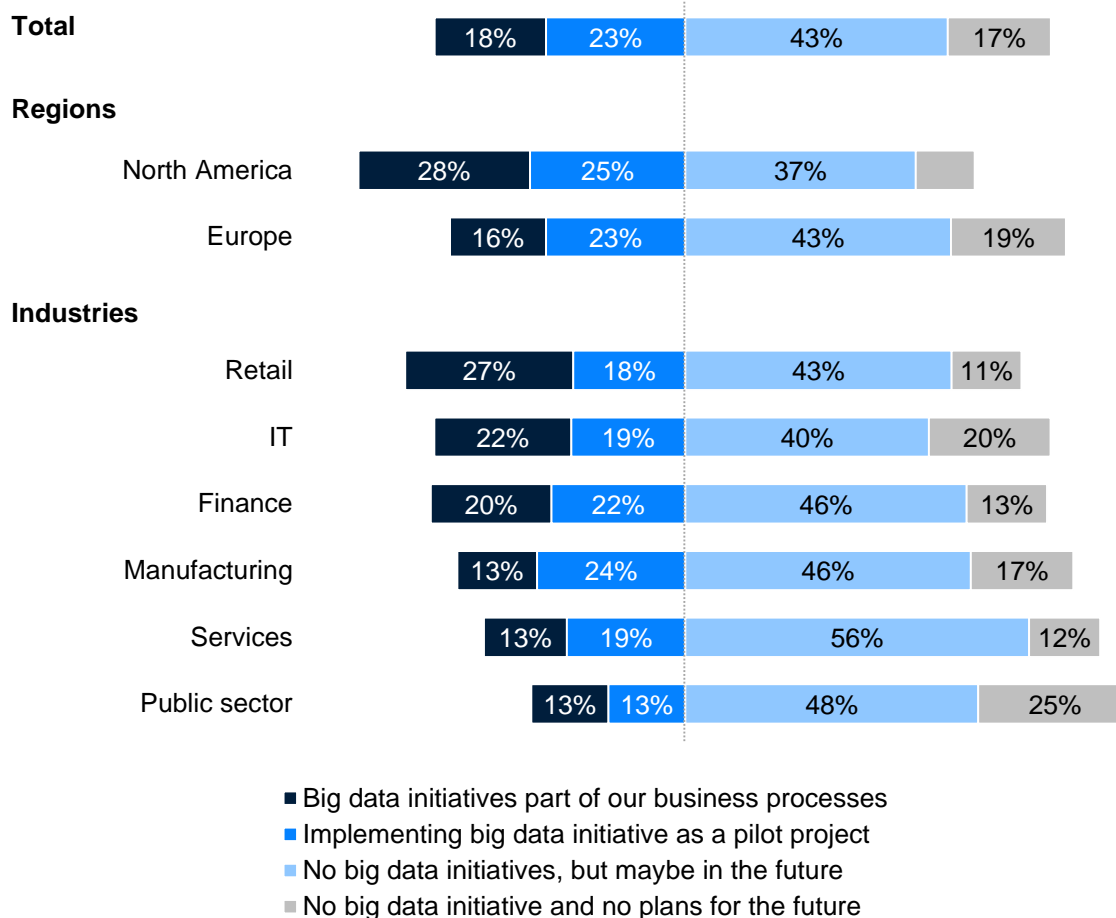


Figure 3: Big data initiatives by region and industry (n=526)

There are a variety of influences driving organizations towards big data initiatives (Figure 4). Heading the list are the three commonly cited “V’s” of Big Data, which stand for volume (57 percent), variety (50 percent) and velocity (46 percent). Other important drivers include better or new data analysis capabilities (55 percent) as well as the desire to build forecasting models to increase the predictability and reduce the uncertainty of future events (51 percent). This statistic, in particular, clearly shows that predictive analytics and forecasting is now seen as an important component in implementing big data initiatives and extracting more value from data. Another interesting point is that BI organizations are drivers behind this topic. For 66 percent of

respondents from this field, building predictive models is the most commonly listed challenge they face with regard to big data. Analyzing large volumes of data (56 percent) is the most frequently cited challenge from IT. Respondents from business departments, in contrast, most commonly stated better or new analysis possibilities (61 percent).

Real-time data usage is an innovative topic that is clearly on the rise. 27 percent of respondents

stated that they want to monitor and analyze streaming data. An astonishing 19 percent also plans to automate decision-making processes.

“Real-time data usage is an innovative topic that is clearly on the rise.”

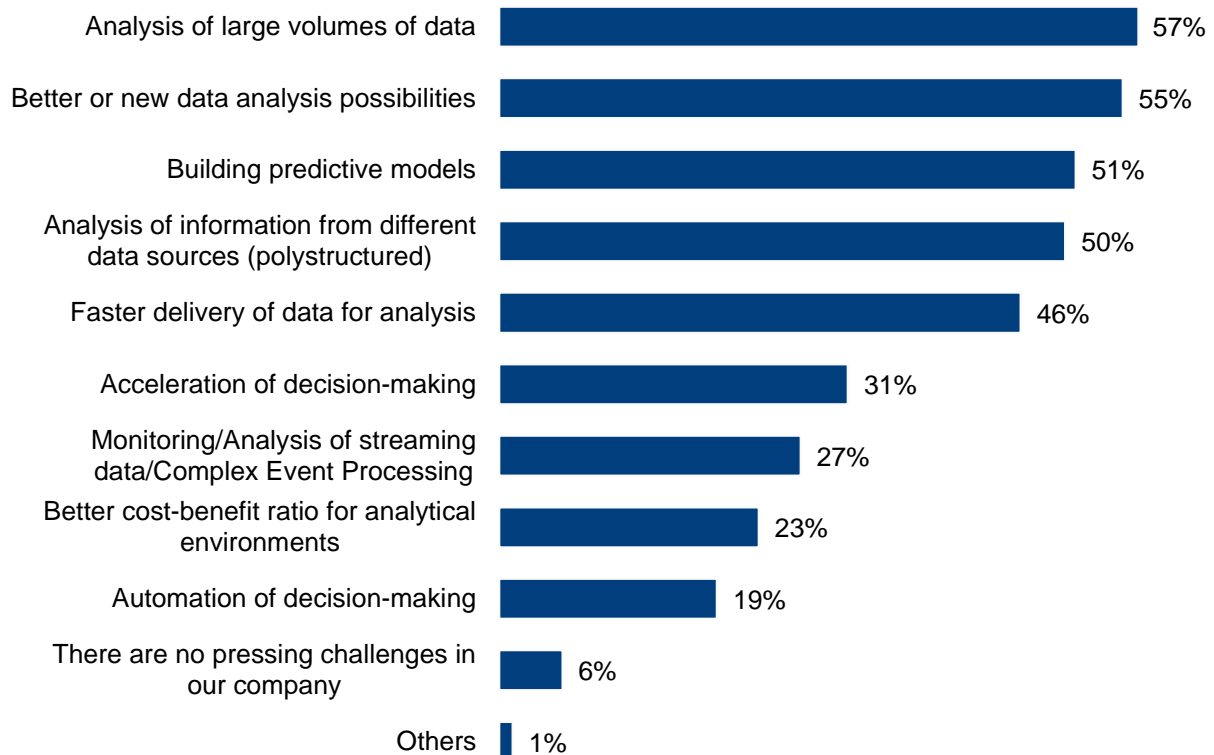


Figure 4: Which problems/challenges would you like to address with big data technologies?
(n=431)

IT (45 percent) and management (43 percent) top the list of thought leaders and drivers behind big data in enterprises (Figure 5). The remaining business departments are still very passive as a whole and are driving the topic considerably less often. We, too, can confirm this based on experience from our own projects with clients. In many cases, either IT uses and suggests big data technologies as a solution to address old or new challenges from the bottom up or management has recognized the strategic benefits of digitalizing and using data and is driving the topic from the top down. But enterprises can only ensure the long-term success of big data when other departments accept and utilize it. There is obviously still work to do in this regard.

Upon closer examination, the data shows that management is a decisive factor for the progress of a big data initiative (

Figure 6). In 61 percent of companies where management is the thought leader or driver behind this topic, big data initiatives are already integrated in business processes. If big data initiatives are in pilot stage or conceivable in the future, management is the thought leader in only 46 percent and 34 percent of cases respectively. What is also striking is that respondents named operational departments such as sales more frequently when big data is already firmly anchored in their business processes.

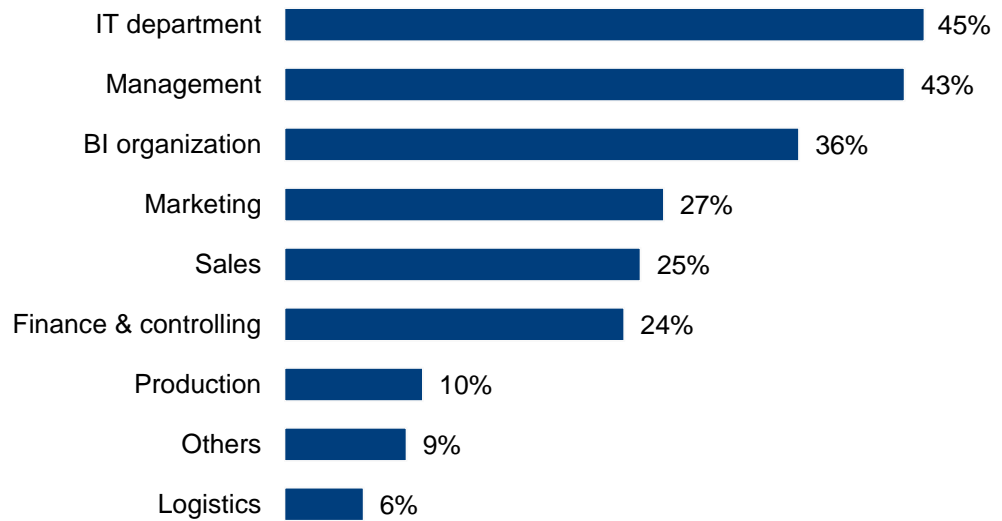


Figure 5: Who are the thought leaders/drivers in your company concerning big data?
(n=433)

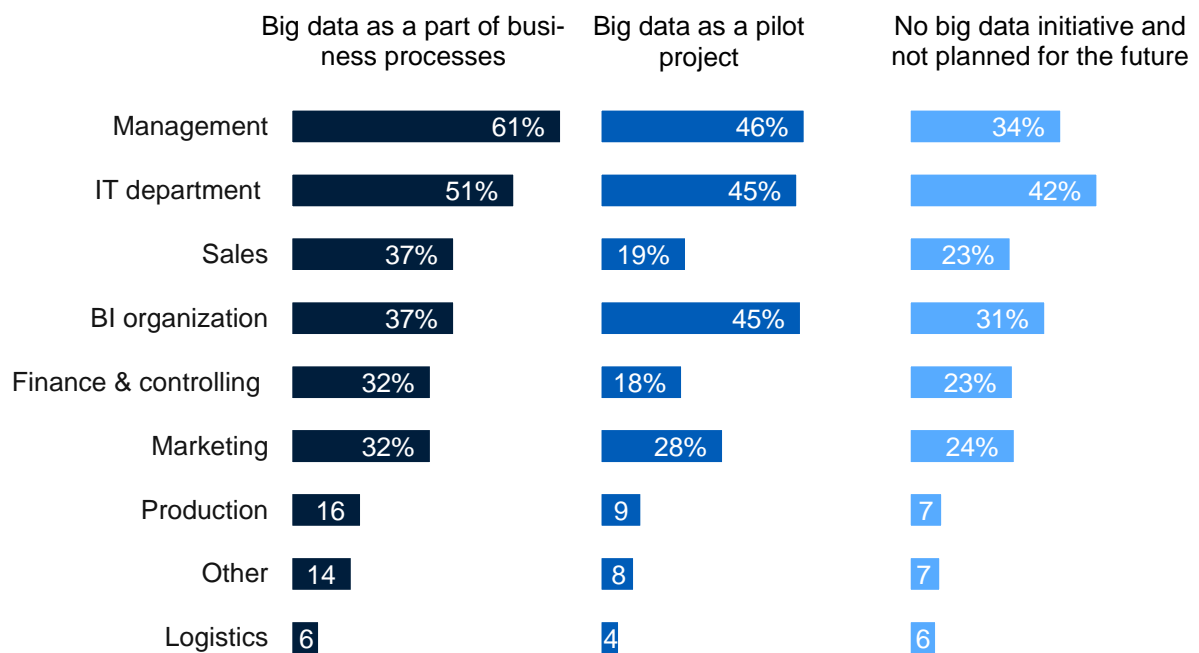


Figure 6: Driver by status quo (n=433)

Big data benefits exceed expectations

Prior to a big data project, companies need to pose a very important question: *What do we get out of it?* This question is not easy to answer, especially because the topic is still relatively

new and, therefore, empirical data about experiences with big data is limited. To provide more clarity around this topic, we asked respondents about their achieved and expected benefits (Figure 7).

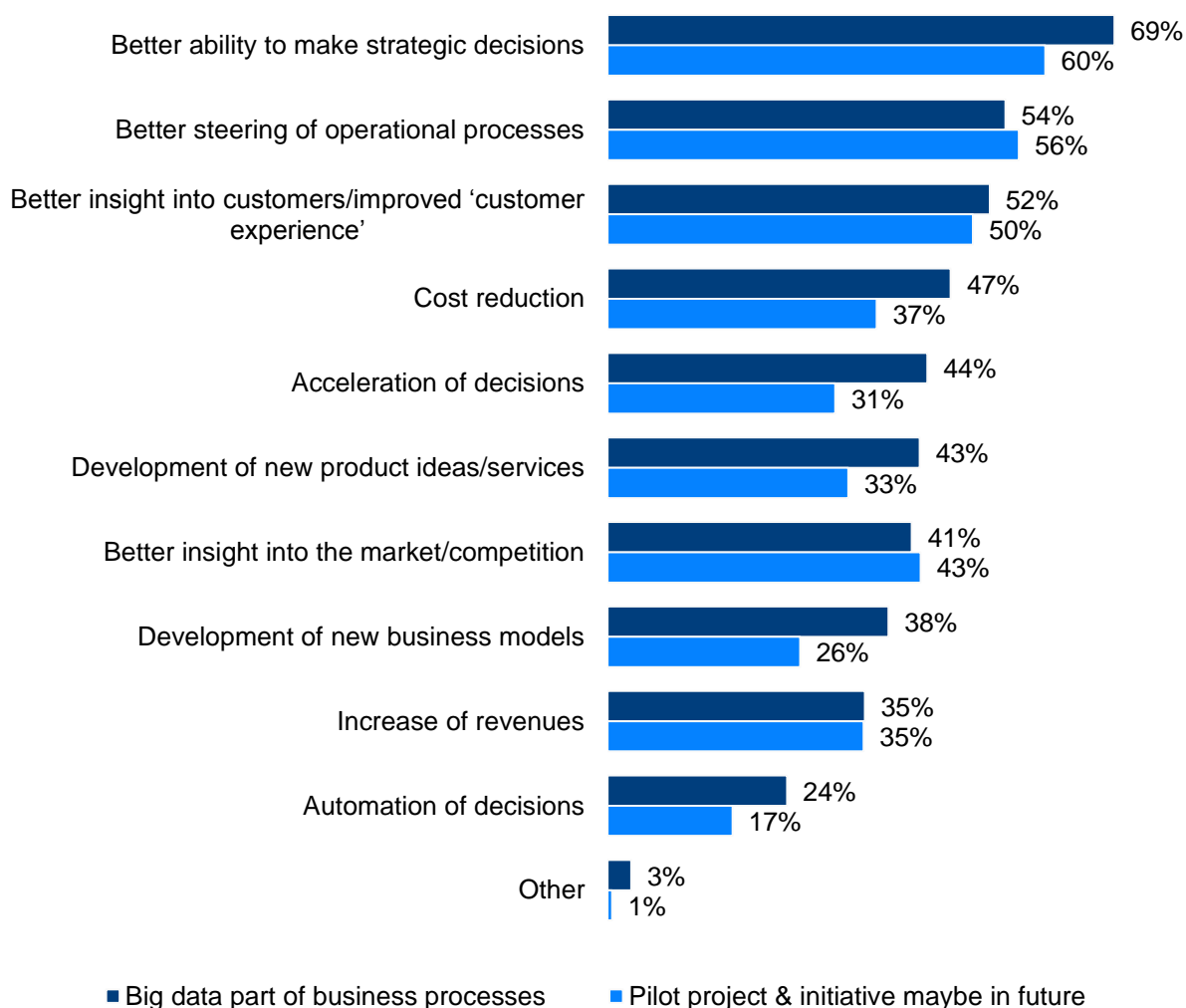


Figure 7: Achieved benefits vs. expected benefits (n=94/335)

The results show that companies see many different benefits from big data analysis. The ability to make better strategic decisions (69 percent) is the most frequently cited answer. Almost one in two companies have improved their ability to steer operational processes, reduced

costs, or improved customer insights/ experience. Expectations for big data, in other words, are broad – from strategic support to steering operational processes. Companies should take this into consideration at the start of each project to avoid making their scope too narrow.

Fortunately, big data initiatives were able to meet – and in some cases even exceed – the relatively high expectations. This especially applies to the answer options that are difficult to predict in advance (e.g. the development of new business models and product ideas, faster decisions, cost reduction and the ability to make strategic decisions).

As expected, however, respondents had a difficult time putting these benefits into actual numbers. Only a third of participants (32 of 94) that have integrated big data into their business processes answered this question (Figure 8). Their responses, however, are impressive. These companies, on average, reported eight percent higher revenues and ten percent lower costs (median values). Some even cited very large benefits, which explains the higher arithmetic mean.

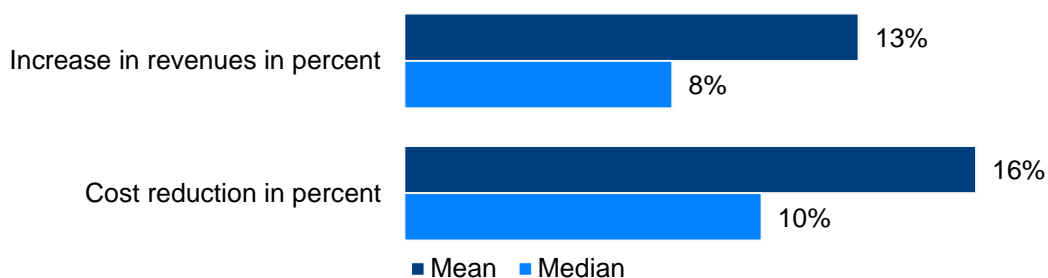


Figure 8: Are you able to quantify the benefits from your big data initiative(s)? (n=31/32)

A closer look reveals further differences between Europe and North America as well as different industries. European companies are more likely to successfully use big data to steer their operational processes and develop new product ideas and services. Their North American counterparts, however, have a clear lead when it comes to faster decision-making (37 percent vs. 61 percent). Big data analyses appear to be one reason behind this – and one that should not to be underestimated.

Expectations also differ by industry. Some obvious variances include:

- Retail primarily expects better insights on customers (85 percent), better steering of operational processes (77 percent) and higher revenues (65 percent).
- Manufacturing has above-average expectations for better control over operational processes (66 percent) and cost reductions (43 percent).
- The finance sector primarily wants to use big data analyses to generate new product ideas (52 percent).

Big data initiatives are on the rise across the enterprise

Big data analyses quite clearly deliver big benefits to companies that already use them today. Figure 9 shows the different departments where companies are using, or planning to use, big data. What is notable is that almost every department conducts big data analyses. Big data, therefore, is truly a universal topic across the organization. The frontrunners are marketing (25 percent) and sales (23 percent), both of which are customer-centric departments. These

departments, along with customer service, also have the highest short-term rates for planned projects. It is also important to mention that the short and long-term rates for planned projects are extremely high for all departments. This is another indication that awareness of the benefits of big data is not just growing, but that companies are also starting to take appropriate action.

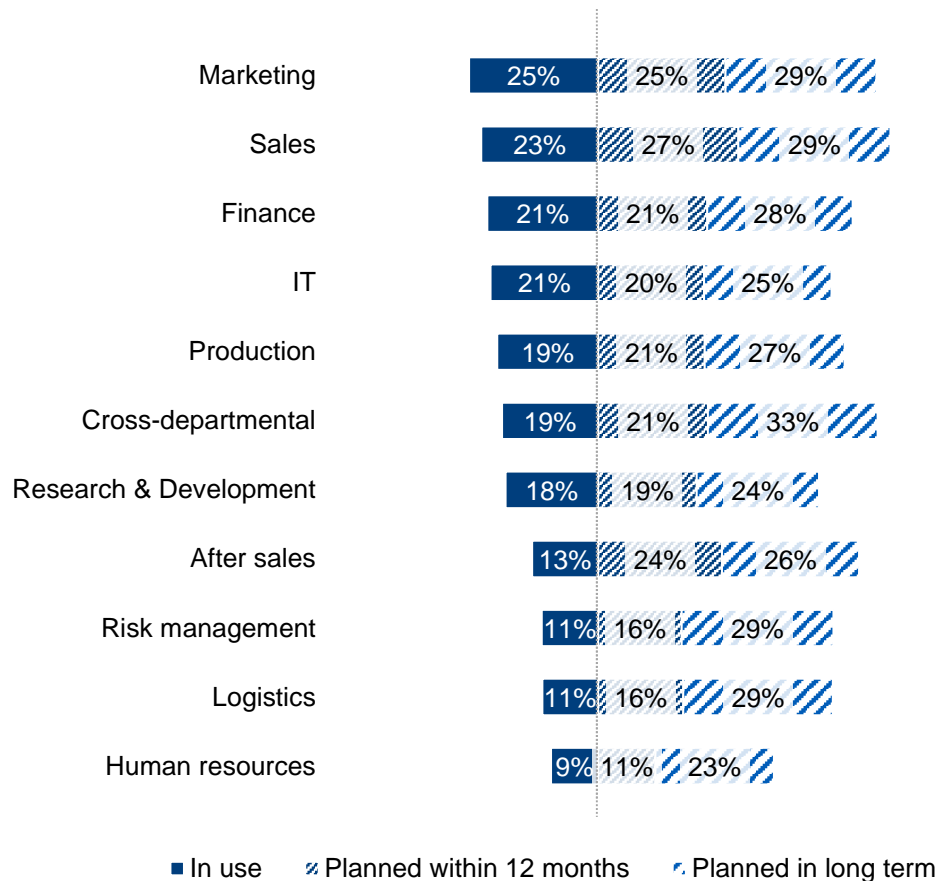


Figure 9: In which areas does your company use, or plan to use, big data analysis? (n=423)

The following sections of this chapter visualize the specific use cases of different departments. To find out how companies use big data analyses, the survey asked open questions to see if responding companies had different scenarios

in use or planned. Overall, more than 1,000 answers were collected. The following word clouds show which key words were mentioned most frequently. The corresponding tables also list the most commonly named use cases by

department (without repeating the frequently used words “data” and “analysis”).



Figure 10: Word frequency of all use cases (n=261)

Big data use cases in cross-department scenarios



Figure 11: Word frequency in cross-department use cases (n=118)

Named use cases in cross-department scenarios
Process optimization, improved process quality
Transparency over all processes, ability to recognize and use synergistic effects
Knowledge management system for more widespread, comprehensive information usage
Integration and distribution of data from multiple departments
Risk management and compliance
Business development analysis and forecasting
Faster response to customer needs
Quality assurance
Cost reduction
Office automation
Resource planning and management (sourcing)
Unified view of customers
Fraud and crime prevention
Portfolio management
Better support of business processes through comprehensive analyses and better calculations
Process progress monitoring (e.g. sales)

Table 1: Named use cases for cross-department scenarios

Big data use cases in sales



Figure 12: Word frequency in sales use cases (omitting the word “sales”, n=152)

Named use cases in sales
Better understanding and prediction of customer behavior, better understanding of customers (360 degree customer view)
Measures to build customer loyalty and minimize customer churn (customer experience/journey)
Better monitoring, more precise monitoring of sales activities
Personalization of sales and marketing activities
Market research/competitive analysis
Pricing and offer optimization
More precise sales planning and forecasts
Potential cross-selling and up-selling opportunities
Improved inventory management
Customer acquisition, lead generation
Customer classification and sales group analysis

Table 2: Named use cases in sales

Big data use cases in customer service



Figure 13: Word frequency in customer service use cases (n=85)

Named use cases in customer service
Customer behavior analysis
Providing data and analyses to field sales and service teams
Customer analyses
Trendspotting in customer surveys
Identification of customers with a high churn risk
Maintenance forecasting, optimization of maintenance cycles
Trend recognition for customer complaints
Global complaint management to identify problems in a timely manner
Calculation of replacement part availability
Warranty analysis
Improved efficiency in service activities by automatically answering questions
Tracking and evaluating customer services
Real-time profitability analysis (e.g. discounts during call center conversations)
Direct marketing and product recommendations
Customer conversion

Table 3: Named use cases in customer service

Big data use cases in marketing



Figure 14: Word frequency in marketing use cases (omitting the word “marketing”, n=152)

Named use cases in marketing
Customer behavior analysis
Providing data and analyses to on-site sales and service representatives
Customer value analysis
Trendspotting in customer surveys
Identification of customers with a high churn risk
Maintenance forecasting, optimization of maintenance cycles
Trend recognition for customer complaints
Global complaint management to identify problems in a timely manner
Calculation of replacement part availability
Warranty analysis
Improved efficiency in service activities by automatically answering questions
Tracking and evaluating customer services
Real-time profitability analysis (e.g. discounts during call center conversations)
Direct marketing and product recommendations
Customer conversion

Table 4: Named use cases in marketing

Big data use cases in finance / controlling



Figure 15: Word frequency in finance / controlling scenarios (n=100)

Named use cases in finance / controlling
Improved reporting (general)
Enterprise planning, budgeting and forecasting
Ability to create an integrated data view
Simpler reporting
Simulations, support in defining strategies
Data analysis (general)
Cost analysis and optimization
Discount and price analysis
Process optimization
Cash flow management, improved liquidity
Consolidation
Compliance

Table 5: Named use cases in finance / controlling

Big data use cases in risk management



Figure 16: Word frequency in risk management use cases (omitting the words “risk” or “management”, n=63)

Named use cases in risk management
Identification of new or previously unknown risks
Identification of “bad” customers
General improvement of risk management
Fraud identification
Credit card fraud
Better risk forecasting and simulations
Identification of correlations and patterns
Identification of external risks
General risk reduction or mitigation
Identification of project risks
Risk monitoring
Compliance
Detailed risk analysis
Operational risks
Forecasting and active monitoring
Avoidance of bad investments

Table 6: Named use cases in risk management

Big data use cases in production

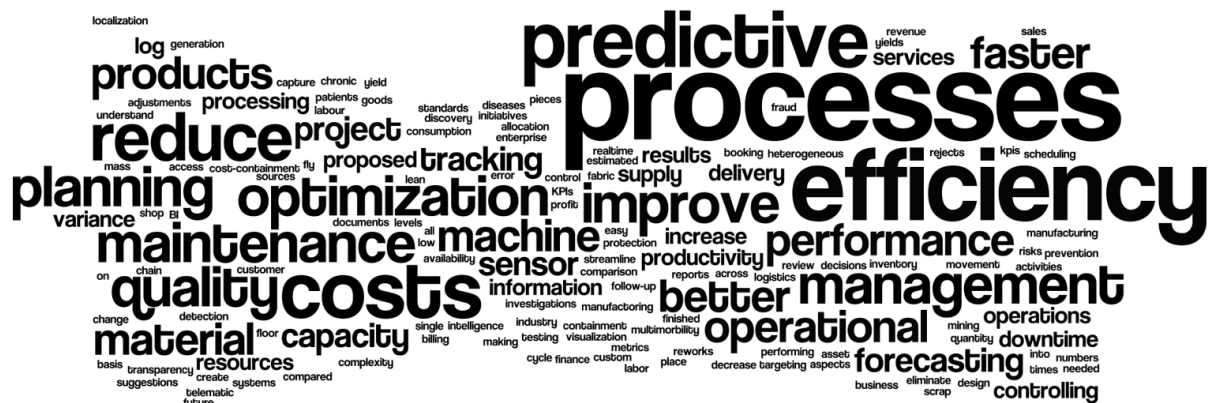


Figure 20: Word frequency in production use cases (omitting the word “production”, n=93)

Named use cases in production
Reporting and analysis of production processes and efficiency
Production planning and optimization (e.g. cycle times, resource planning, capacity)
Machine monitoring, sensor data, asset management
Quality management
Production process management
Cost reduction
Material analysis (e.g. usage)
Service interval management, predictive maintenance
Product individualization
Profitability analysis and improvements
Tracking and analysis of telematics and transportation data
Performance and production forecasts
Shorter downtimes
Fraud detection and reduction
Access to documents
Measuring quality of production data
Benchmarking

Table 10: Named use cases in production

Big data use cases in logistics/supply chain



Figure 21: Word frequency in logistics/supply chain use cases (n=74)

Named use cases in logistics/supply chain
Workflow management, process optimization
End-to-end reporting (from sourcing to shipping)
Route optimization
Optimized goods distribution / dependable, on-schedule deliveries
Supply of goods
Inventory management and optimization
Lead time optimization
Transport optimization
Tracking
Logistics planning and optimization
Quality management
Maintenance optimization
Supplier and customer evaluation (scoring)
Infrastructure design
Capacity planning
Resource planning
Sales forecasting

Table 11: Named use cases in logistics/supply chain

Companies still rely heavily on standard BI tools, but change is in the air

Although discussions about big data have centered on technical aspects for a long time, the focus has switched to concrete usage scenarios. Nevertheless, which technologies companies use is still a very relevant question. Big data analyses are often only possible in combi-

nation with new technologies or ones which haven't received much attention in the past. The current market for these technologies is highly dynamic, and many tools promise a wide spectrum of benefits. But which technologies have actually made their way into organizations, and which ones are on their radar for the future?

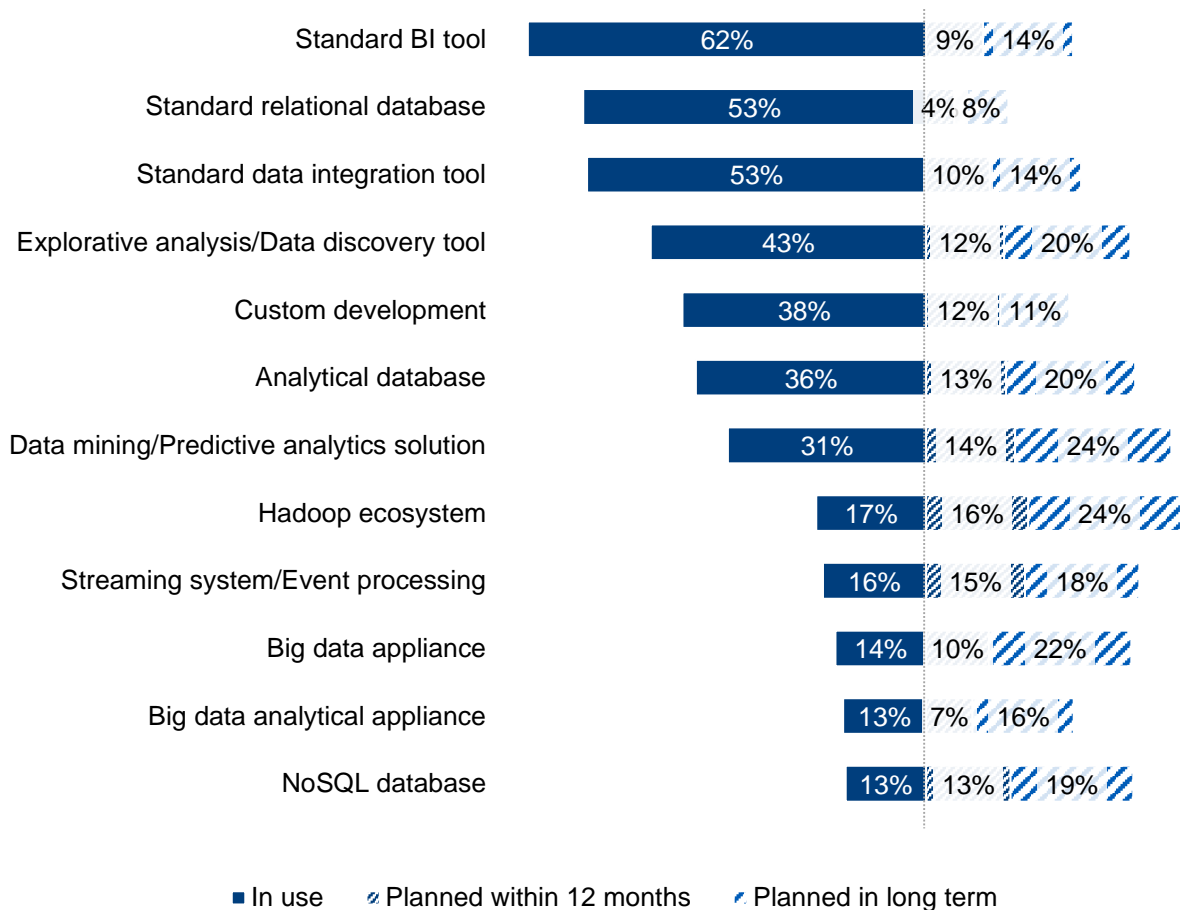


Figure 22: Which technologies do you use/plan to use in your company for big data?
(n=428)

The three technologies that companies most commonly use today for big data are all standard technologies. Organizations most frequently cited standard BI tools and relational databases (Figure 22), which underlines the importance of structured data in a big data context. It is also apparent that big data technologies will not simply replace standard BI tools, which will continue to play an important role in the future.

The challenges that coincide with big data initiatives (as shown in Figure 4), however, show that standard tools will be extended with specialized technologies more and more in the future. In fact, technologies that increase the usa-

bility of polystructured data (e.g. Hadoop ecosystems, NoSQL databases), increase the speed of analyses

(streaming systems) or enable better forecasts (predictive analytics solutions) have the highest rankings for planned investments.

The growing number of big data use cases and adoption of new technologies go hand in hand. As a result, companies will soon face even more heterogeneous IT landscapes, which will create further challenges.

Technologies that increase the usability of polystructured data, increase the speed of analyses or enable better forecasts have the highest rankings for planned investments.

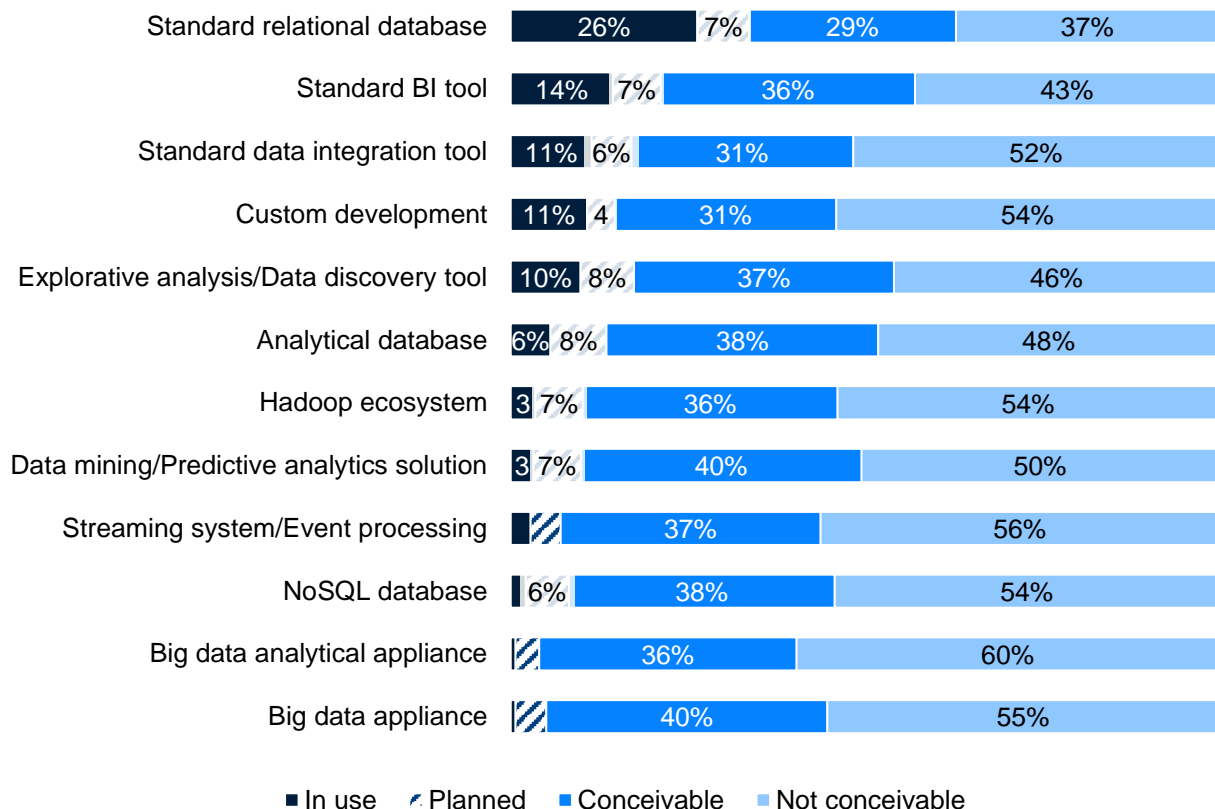


Figure 23: Which of the following technologies do you use, or can you envision using, in a cloud environment? (n=454)

When discussions focus on improved flexibility and agility, the cloud plays an important role. Figure 23 illustrates how companies view this topic by showing which technologies they operate in the cloud as well as which ones they plan to deploy or could conceive of deploying there. Companies most frequently use relational databases (26 percent) – in other words, a technology that they know and can gauge as a whole.

However, most technologies are rarely deployed in the cloud and even planned investments are relatively meager for all technologies. It also seems that organizations are divided into one of two groups. Approximately half are generally open to operating big data technologies in the cloud while the other half cannot even conceive of it.

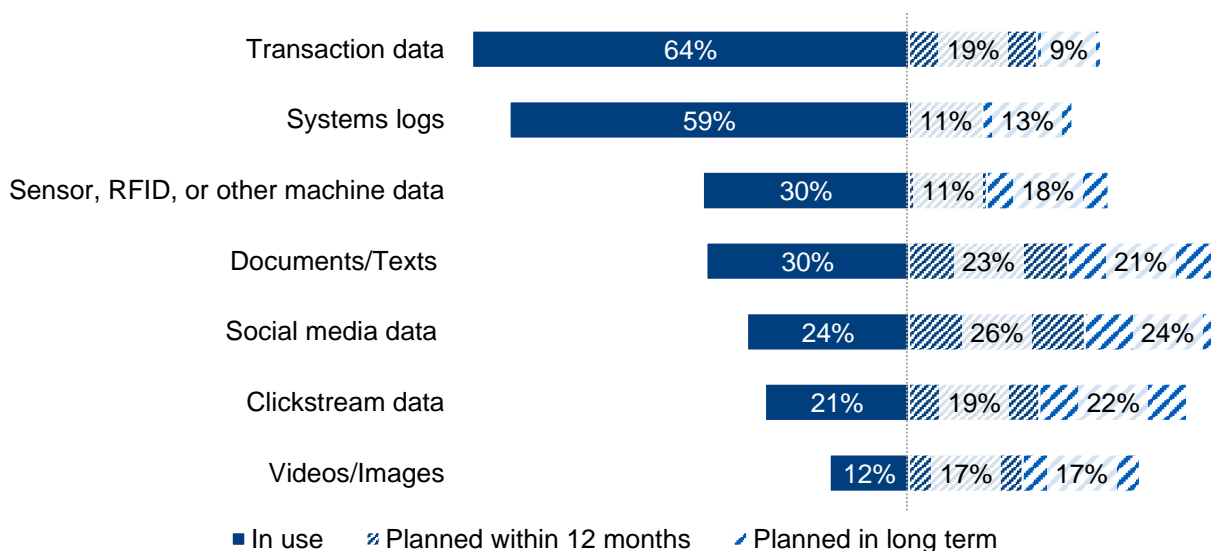


Figure 24: Which of the following data types does your company use for big data analysis?
(n=208)

The data that companies use for big data analysis (Figure 24) reflects the strong use of standard BI technologies in big data. Among the companies that already use big data analysis, data from transaction systems ranks first (64 percent). This data often plays a crucial role both alone and in combination with other data sources. Log files from IT systems (59 percent) are also widely used, most likely from IT departments to analyze their system landscapes.

Practically all types of data are on the rise. This offers further proof that companies are increasingly aware of their data's value and want to utilize it accordingly. Unstructured data, such as documents/texts or social media and streaming data, ranked highest for planned usage. There is also a correlation between customer-centric use cases that frequently use these data types and the planned usage of technologies that make this data easier to use.

Big data is a job engine

Since big data is just establishing itself in enterprises, questions regarding its financing are of particular interest. How are companies financ-

ing these initiatives? Where are these investments flowing? Are budgets growing bigger, getting smaller, or staying constant?

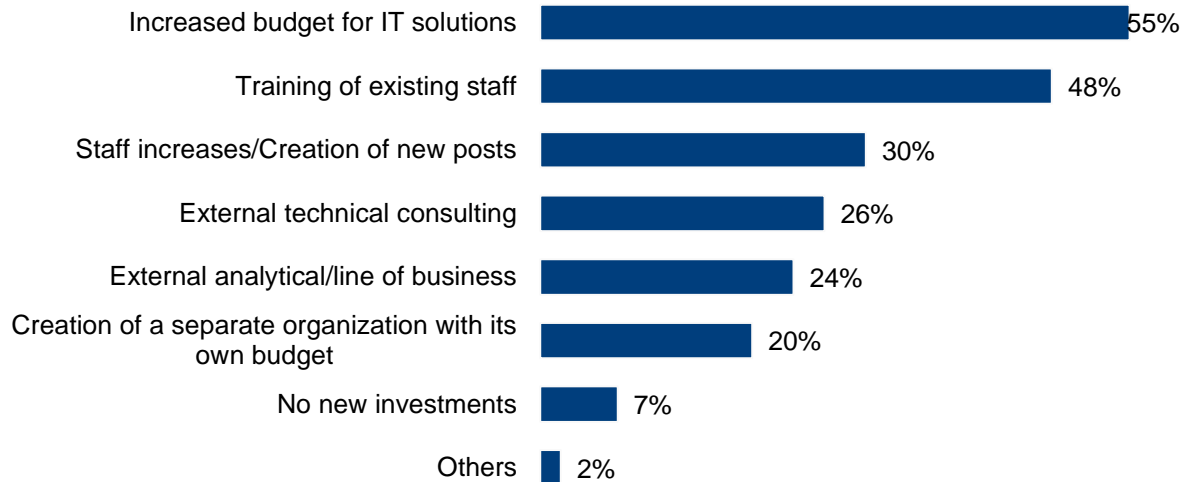


Figure 25: Where are the big data investments in your company being directed? (n=208)

In companies that already use big data, most investments flow into a higher budget for IT solutions (Figure 25). Creating the technological requirements is apparently the first priority. But since the best technology does not deliver the desired benefits without qualified personnel,

companies are also making investments to train existing staff (48 percent) as well as hire new employees. 30 percent of companies that already use big data want to create new jobs in this area. Big data, in other words, is a job engine.

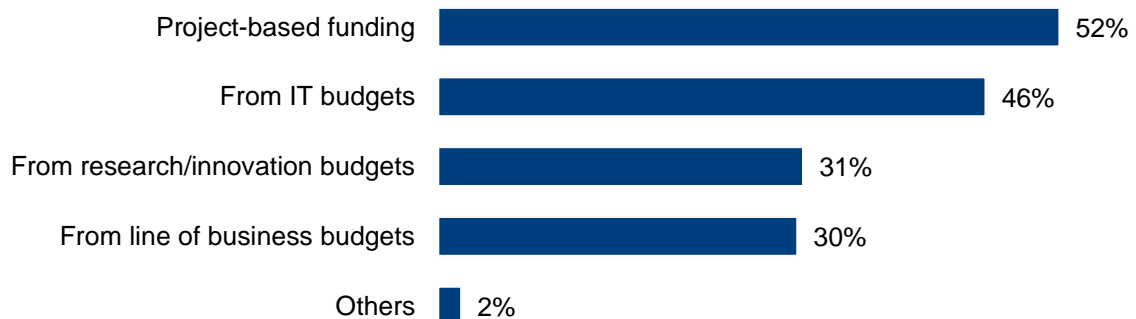


Figure 26: How are your big data initiative(s) funded? (n=209)

So where do the budgets for these investments originate? Survey responses reflect the early stage of many big data initiatives (Figure 26). 52 percent of companies that already use big data fund their initiatives on a project-by-project basis. The topic is apparently not so tightly integrated in business processes that it flows into a fixed budget. If it is part of the process, the funding primarily comes from the IT budget (46 percent). This is a further indication that big data is still usually driven as technical topic.

A deeper look also reveals differences by region. While funding in North America frequently stems from IT (54 percent vs. 43 percent in Europe) and line of business budgets (39 percent vs. 24 percent), European companies are more likely to tap research budgets (20 percent in North America vs. 37 percent in Europe). In North America, expenses for big data are more commonly part of a fixed budget than in Europe. This, too, shows that North American companies are simply further along the road than their European counterparts when it comes to big data.

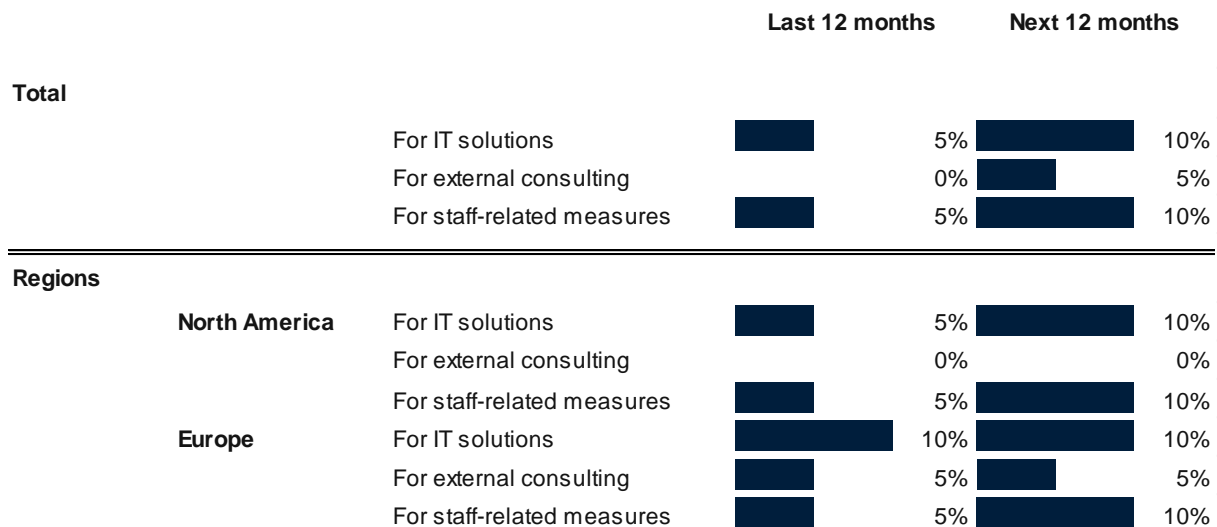


Figure 27: Changes in the big data budget in the past and next 12 months (median) (n=222)

Changes in big data budgets are a clear sign that big data has established itself in companies (Figure 27). Expenditure on IT solutions and staff-related measures have both increased in the past twelve months. In companies that at least could conceive of big data initiatives, expenditure has gone up by five percent (median value). These companies, on average, are even planning a further five percent increase across the board for the coming twelve months.

The results in the different regions are somewhat surprising. European companies invested five percent more on average in IT solutions and external consulting than North American ones. Since the absolute values behind these increases are unknown, we can assume that the lower investment in North America can be attributed to budget increases already made in the past. European companies have apparently recognized that they need to increase their investments if they want to keep up with the competition in North America.

Insufficient skills are curbing the big data boom

Enterprises can derive substantial benefits from big data analysis. Nonetheless, they face a series of problems related to big data projects (Figure 28). As a whole, big data appears to be

a topic that brings many benefits, but many problems as well. Only six percent of all respondents said that they see no issues connected with using big data technologies.

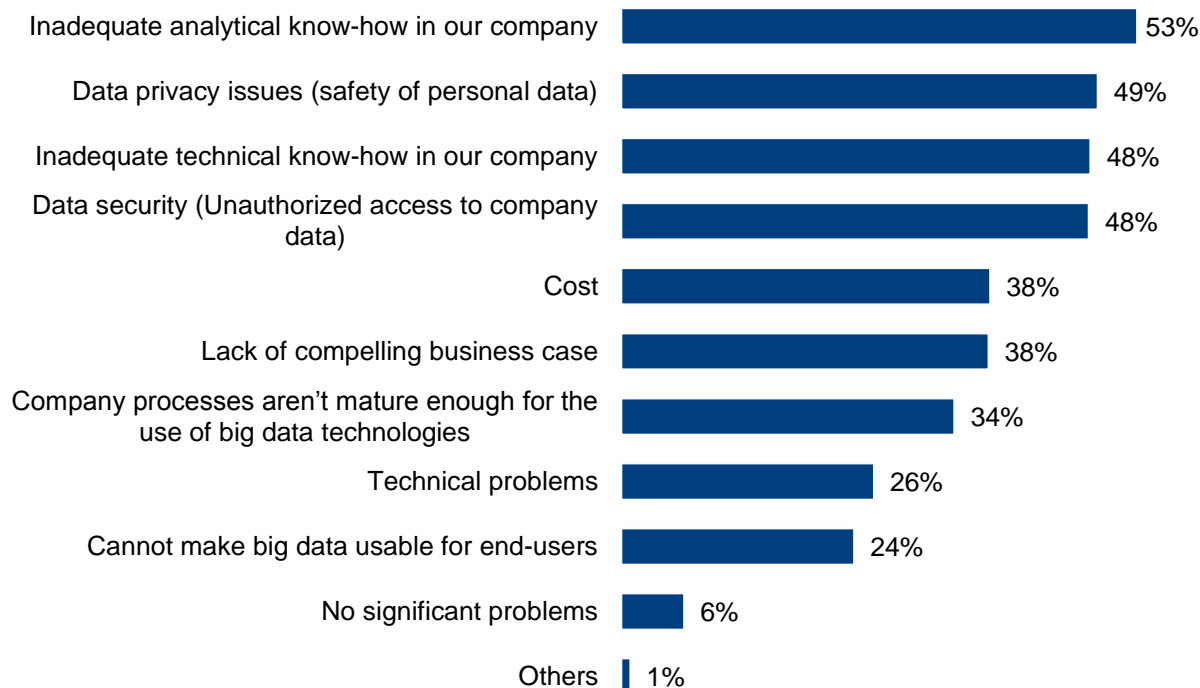


Figure 28: What problems do you see when using big data technologies/analysis? (n=545)

Problems related to the lack of necessary skills were cited particularly often. Approximately half of respondents reported having inadequate analytical or technical know-how. The current labor market, quite frankly, does not offer adequate, qualified personnel.

This problem is not regional as both North American and European companies reported similar grievances.

The rates for inadequate analytical and technical know-how are around 50 percent in both regions. Although companies may want to create jobs in this area, they might not be able to fill them due to the lack of suitable candidates on the labor

“Approximately half of respondents reported having inadequate analytical or technical know-how.”

market. This shifts the focus towards training existing staff members.

Data privacy and security also rank high on the list of problems for companies. The high value placed on data privacy is not surprising considering that many use cases revolve around customers. As analyses center even more on customers, companies will have to focus even harder on anonymizing data to protect customer privacy. That means elaborate processes will need to take place before the actual analyses begin. The content, technical imple-

mentation and legal issues related to these processes all pose major challenges for companies today.

When it comes to big data, data security is also a major issue. Big data can contain business-critical

knowledge. In addition,

new problems can also arise in accessing new systems. Manufacturers, for example, regard anything accessing their machines to capture machine data with suspicion. The reason is that these machines contain programs that are necessary for operations and must be protected as critical intellectual property. Companies also harbor insecurities about saving and transferring data in cloud-based systems (e.g. social media). These uncertainties need to be addressed as well.

38 percent of companies still complain of a lack of compelling business cases. This number is very high, especially given the amount of coverage big data receives in the IT and business

media. The missing ingenuity to gain more benefits from using data, changes of the business models on company data, or the lack of trust to profitably implement new methods and technologies are all common problems. Technical issues, in contrast, are not the main obstacle to deploying big data technologies. Only 26 percent of respondents view them as a problem.

Aside from inadequate know-how, the results from North America and Europe were similar in other areas as well. Data privacy (50 percent in North America vs. 49 percent in Europe) and data security (56 percent in North America vs. 46 percent in Europe) stand out in particular. Contrary to popular belief, it does not appear that North American companies place less value on data privacy.

The only noticeable differences lie with technical problems, which are more widespread in North America (30 percent vs. 23 percent).

This, however, is not surprising because North American companies are more likely to be fore-runners with regard to big data and adopt new technologies at an earlier stage.

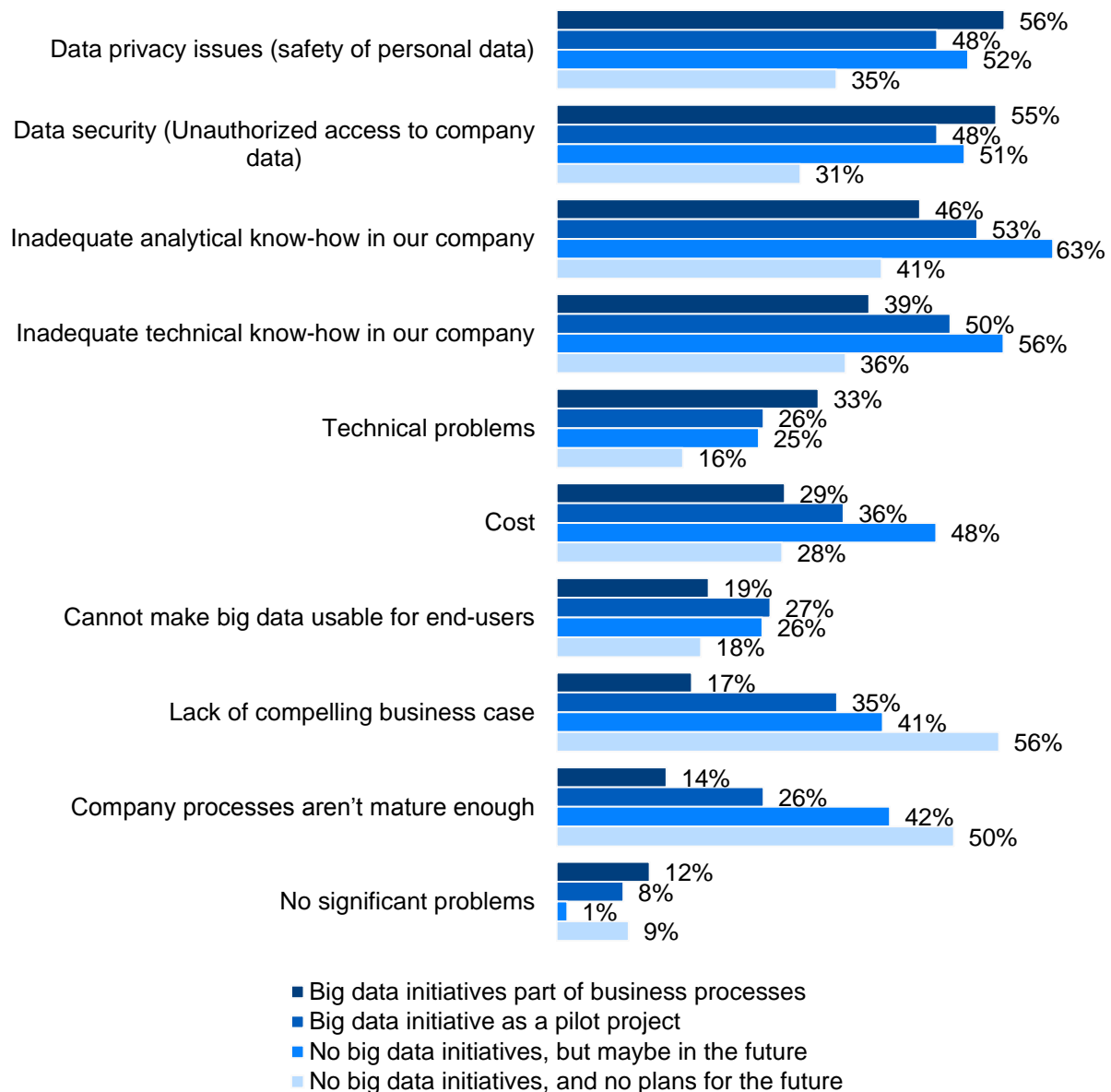


Figure 29: Problems by status quo (525)

A quick glance at the problems that companies face in the different stages of their big data initiatives also reveals further insights (Figure 29). Those that currently have no big data initiatives planned for the future appear to face two main dilemmas. While 56 percent of these companies have found no compelling business cases for big data processes, 50 percent stated that their business processes are not mature enough for big data. Companies that currently have no initiatives but are considering them in the future have large deficits in the requisite

skillsets and are more likely than average to encounter problems financing big data initiatives (48 percent).

Surprisingly, companies that have already implemented big data into their processes still reported high rates of inadequate know-how. Their most serious issues, however, are data privacy and security, which they appear to have underestimated before.

While there are no major differences in the named problems by region, a closer look does expose a few interesting findings by industry. The finance sector is more likely than average to cite a lack of compelling business cases (53 percent). Manufacturing, however, faces more problems than average with inadequate know-how, both in analytical (63 percent) and technical (61 percent) respects. This is apparently a

major obstacle that these companies will need to monitor on their road to “Industry 4.0”. In the public sector, data privacy (68 percent), costs (54 percent) and inadequate business cases (51 percent) top the list of common issues.

“Inadequate know-how is apparently a major obstacle that companies will need to monitor on their road to “Industry 4.0”.”

Recommendations

Based on the findings of this survey, companies should take the following recommendations to heart:

- Now is the time to start your big data initiatives! The respondents in this study show that there are many different use cases and substantial benefits to be attained from analyzing big data. Start with a pilot project that incorporates different departments, data types and processes.
- Be creative! Give your employees the opportunity to evaluate the many examples in this study as potential use cases in your own company. More importantly, give them the leeway to make their own suggestions as to how data can help improve specific processes or business models.
- Top management is an important driver, but you also need protagonists at other levels of the business. These leaders can ensure that the various business cases are integrated into day-to-day activities.
- Start training your existing staff while scouring the labor market for technical and analytical expertise in big data. You'll need it.
- Draft an enterprise data strategy that includes big data and all other information. By categorizing your data into privacy classes and security zones with appropriate guidelines and responsibilities, you can help make data privacy and security more tangible and reduce uncertainty.
- Keep in mind that big data projects are often explorative when it comes to data. Regular Business Intelligence methods are not the right standard. Data experiments must be able to fail quickly so that users can learn from them and move closer to a good – or perhaps even a groundbreaking – solution.

Attachment A: Methodology and demographics

The online user survey was conducted world-wide from December 2014 through February 2015. BARC promoted this survey through Web sites, at events and in email newsletters.

A total of 559 people participated in this survey. Most participants (37 percent) came from Ger-

many, Austria and Switzerland (Figure 30) followed by North America (22 percent). Other participants were distributed relatively evenly across other regions of Europe and the rest of the world, with the exception of Africa and the Middle East, which only comprised four percent of this random sample.

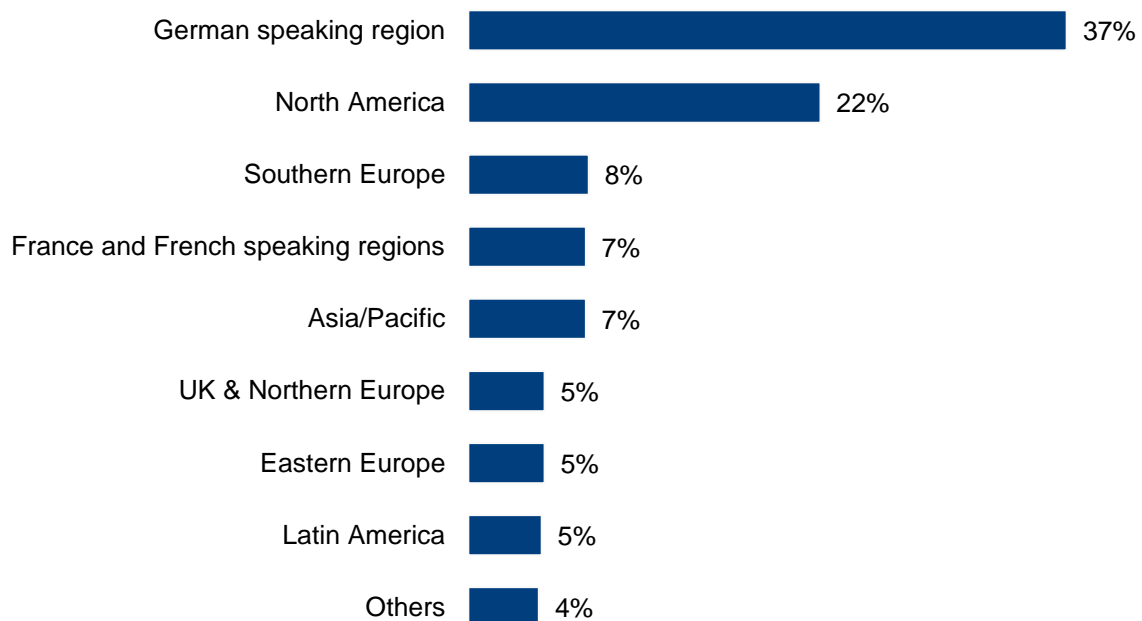


Figure 30: Countries/Regions (n=546)

Respondents came from a wide range of industries (Figure 31), most notably IT (16 percent),

manufacturing (14 percent), consulting (13 percent) and retail (8 percent).

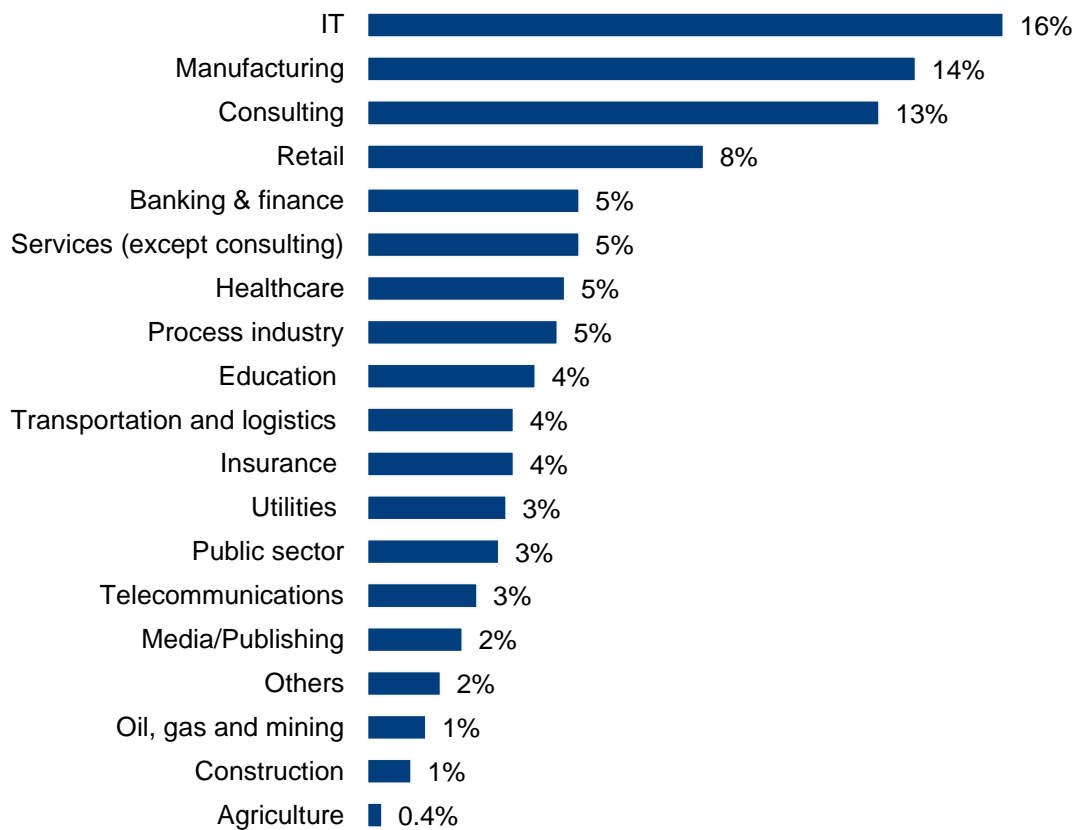


Figure 31: Industries (n=543)

Figure 32 shows respondents' company sizes by the number of employees. Organizations with 250 through 5,000 employees were the best represented in this study. Companies of

other sizes, however, were also well represented with 32 percent having more than 5,000 employees, and 29 percent with less than 250 employees.



Figure 32: Company size (n=543)

A closer look at the professional backgrounds of the respondents reveals a predominance of IT (42 percent) (Figure 33). Among business roles, finance/controllers (17 percent) and management (14 percent) were most commonly

represented. 14 percent of respondents also belonged to a multi-departmental BI organization, for example, a Business Intelligence Competency Center (BI CC).

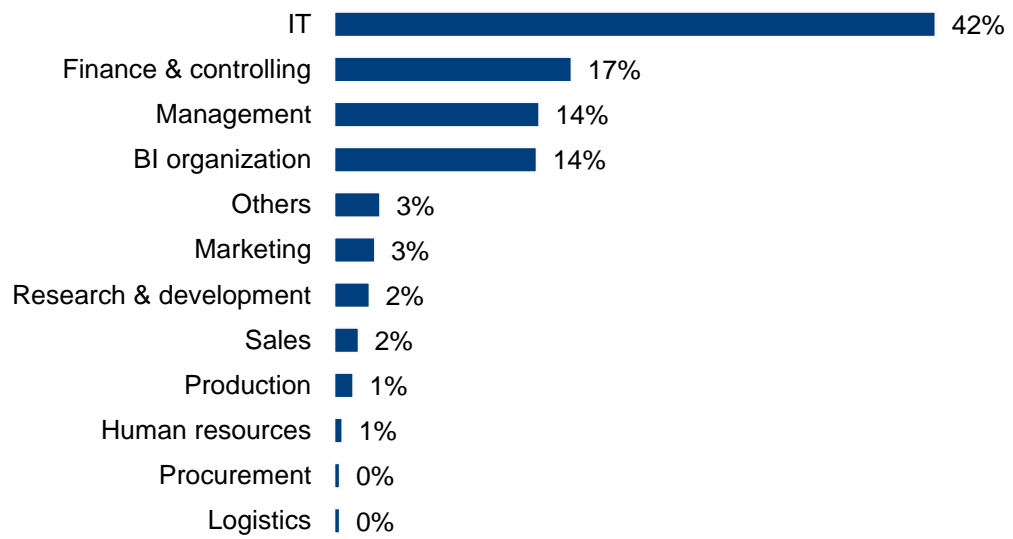


Figure 33: Departments (n=530)

Business Application Research Center (BARC)

www.barc-research.com

Company profile

BARC is a leading enterprise software industry analyst and consulting firm delivering information to more than 1,000 customers each year.

For over fifteen years, BARC has specialized in core research areas including Data Management (DM), Business Intelligence (BI), Customer Relationship Management (CRM) and Enterprise Content Management (ECM).

Along with CXP and Pierre Audoin Consultants (PAC), BARC forms part of the CXP Group –



the leading European IT research and consulting firm with 140 staff in eight countries including the UK, France, Germany, Austria and Switzerland.

CXP and PAC complement BARC's expertise in software markets for BI, DM and ECM with their extensive knowledge of technology for IT Service Management, HR and ERP.

Sponsor profiles

Blue Yonder

www.blue-yonder.com

Company profile

Blue Yonder is the leading SaaS provider for predictive applications in Europe and has recently been listed in Gartner's 'Cool Vendors in Data Science 2015' Report.

The enterprise's platform automates decision-making in real time and supplies precise forecasts. The company, which was founded in 2008 in Karlsruhe, Germany, makes industry-specific forecasting software that customers like Eurotunnel, EAT., Natsu, Kaiser's Tengelmann, and Bosch use to optimise their core processes and become predictive enterprises. The company was founded by ex-CERN researcher, Prof. Michael Feindt and is backed by leading private equity firm Warburg Pincus and the Otto Group.

It uses scientifically-based and innovative techniques such as predictive modelling and machine learning to help enterprises boost their profits. The scalable and cloud-based platform from Blue Yonder provides accurate forecasts for sales planning and automated materials planning. It is also used in dynamic pricing and customer analyses.

blueyonder

Forward looking. Forward thinking.

In January 2014, Blue Yonder created the Data Science Academy to provide enterprises with relevant specialised knowledge and to train decision-makers from management to IT departments. Blue Yonder's work has won many awards, among them the IoT Award 2014, BT Retail Week Technology Award, the German Innovation Prize, and the FOCUS Digital Star Award.

Contact Details

Dunja Riehemann
Director Marketing
Blue Yonder GmbH
Ohiostraße 8
D-76149 Karlsruhe
Tel +49 (0)721 383 117 0
dunja.riehemann@blue-yonder.com
www.blue-yonder.com

Cloudera

www.cloudera.com

Company profile

Cloudera is revolutionizing enterprise data management by offering the first unified Platform for big data, an enterprise data hub built on Apache Hadoop. Cloudera offers enterprises one place to store, access, process, secure, and analyze all their data, empowering them to extend the value of existing investments while enabling fundamental new ways to derive value from their data. Cloudera's open source big data platform is the most widely adopted in the world, and Cloudera is the most prolific contributor to the open source Hadoop ecosystem. As the leading educator of Hadoop professionals, Cloudera has trained over 40,000 individuals worldwide. Over 1,700 partners and a seasoned professional services team help deliver

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greater time to value. Finally, only Cloudera provides proactive and predictive support to run an enterprise data hub with confidence. Leading organizations in every industry plus top public sector organizations globally run Cloudera in production.

Contact Details

Cloudera Inc.
1001 Page Mill Road Bldg 3
Palo Alto, CA 94304
Email: press@cloudera.com

Hewlett-Packard

www.hp.com/de

Company profile

About HP

HP creates new possibilities for technology to have a meaningful impact on people, businesses, governments and society. With the broadest technology portfolio spanning printing, personal systems, software, services and IT infrastructure, HP delivers solutions for customers' most complex challenges in every region of the world. More information about HP (NYSE: HPQ) is available at <http://www.hp.com>

Information Management including Big Data is one of the four strategic pillars of HP – besides Mobility, Cloud and Security.

HP Big Data Solutions and Services

HP's portfolio for Big Data delivers the necessary end-to-end services and solutions to facilitate the successful implementation of Big Data initiatives, and to enable enterprises to handle the growing volume, variety, velocity and vulnerability of data that can cause these initiatives to fail.

HP Big-Data-Technologies:

HP's Big Data solutions and services are based on Haven, a big data analytics platform, which leverages HP's analytics software, hardware and services to create the next generation of big data-ready analytics applications and solutions. Haven combines proven technologies from HP Autonomy, HP Vertica and HP Enterprise Security, as well as key industry initiatives such as Hadoop.



HP's infrastructure is based on the HP Big Data Reference Architecture (BDRA), a modern, flexible architecture for the deployment of big data solutions. It is designed to improve access to big data, rapidly deploy big data solutions, and provide the flexibility needed to optimize the infrastructure, e.g. for Hadoop.

Big Data Use Cases

HP helps enterprises help customers to plan and implement big data use cases in all different industries. Use cases examples include warranty analytics, sensor data analytics, real-time, cross-channel marketing, customer service and demand prediction, detecting and preventing fraud, ensuring compliance in real time, etc.

Contact Details

Hewlett-Packard GmbH
Herrenberger Str. 140
71034 Boeblingen
Tel.: 07031 – 14-0, E-Mail: gh@hp.com
Internet: www.hp.com/de

Information Builders

www.informationbuilders.com

Company profile

Information Builders helps organizations transform data into business value. Our software solutions for business intelligence and analytics, integration, and data integrity empower people to make smarter decisions, strengthen customer relationships, and drive growth. We are known for delivering the world's most widely deployed Business Intelligence and Analytic solutions, reaching thousands through millions of users on single applications. Our software stack also ensures accuracy through comprehensive data quality and master data management solutions. Information Builders is inspired by the potential of Big Data, helping organizations create new insight and opportunity from new sources of data. We are currently engaged in some of the industry's most innovative and largest scale Big Data projects incorporating machine generated data, social media analytics, location intelligence, customer activity monitoring, web analytics and more. Information Builders partners

Information Builders

with all providers of Big Data storage, supporting Hadoop, columnar database, and other technologies. Let us show you how to not only analyze Big Data, but monetize it to generate new revenue and profit.

Information Builders provides analytic solutions to leading organizations in all industries including Financial Services, Manufacturing, Insurance, Healthcare, Retail, Logistics, Telecommunications, as well as Government and Education. Our dedication to customer success is unmatched in the industry. That's why tens of thousands of leading organizations rely on Information Builders to be their trusted partner. Founded in 1975, Information Builders is a global company headquartered in New York, NY, with offices around the world, and remains one of the largest independent, privately held companies in the industry. Visit us at informationbuilders.com and follow us on Twitter at @infobldrs.

pmOne

www.pmone.com

Company profile

Founded in 2007, pmOne AG is a software vendor and consultancy specializing in solutions for Business Intelligence and Big Data. pmOne builds solutions using the technology platforms of Microsoft and SAP combined with its own software cMORE. cMORE helps business users quickly build and efficiently operate scalable reporting and analysis solutions that they can extend to meet their changing needs. pmOne also sells and implements Tagetik, a leading global software solution for enterprise planning and consolidation. MindBusiness GmbH, a company specializing in SharePoint solutions and services for Office rollouts, is also a member of the pmOne Group. pmOne has 200 employees in 8 offices in Germany, Austria and Switzerland.

cMORE enables companies to quickly build, flexibly grow and efficiently administer solutions for Business Intelligence (BI) and Big Data – while leveraging existing technology investments from SAP and Microsoft. cMORE extends the capabilities of the Microsoft BI stack, including SQL Server, Excel, and SharePoint. cMORE is an acronym for collaboration, modeling and reporting.

cMORE Reporting products simplify standard and ad-hoc reporting by intelligently extending your existing software infrastructure. Users continue working with familiar tools such as Microsoft Excel and Microsoft SharePoint, so you profit from shorter implementation and training



cycles. By giving business professionals better tools for creating and distributing reports, the innovative user interface delivers self-service BI for today's business users. cMORE Reporting products are based on principles of good "information design" and enterprise-wide standardization. These concepts help companies implement a more effective and intuitive environment for reporting in accordance with scientifically proven principles.

pmOne AG has successfully implemented solutions at several companies and different industries, i.e.:

- Enterprise Data Warehouse at Air Berlin;
- Single platform with the flexibility to meet multiple finance department requirements at Kistler Switzerland;
- Integrated enterprise planning tool with rich standard functionality at Henkel
- Enterprise Data Warehouse which improves Group-wide reporting and analysis capabilities at Heraeus
- Supporting different financial processes and requirements in a single application at Vorwerk.
- Comprehensive technology platform with a central database for group consolidation, reporting and planning at Dyckerhoff

SAS

www.SAS.com

Company profile

SAS is one of the world's largest software companies with a turnover of over three billion US dollars and it is the largest provider of big data analytics software. Around the world, customers at 75,000 locations use SAS solutions to gather concrete information from their wide range of business data (big data) for strategic decisions (analytics) to improve their performance. SAS solutions are used in a variety of sectors including banking, insurance, manufacturing and trade. With solutions from SAS, trading companies can increase customer satisfaction, optimize online shopping, evaluate data from social media and call centers, and reduce their marketing costs. Amongst other aspects, banks profit from better risk and fraud management.

What distinguishes SAS? Solutions from SAS help companies to make the most of their data. No matter how much data you have and how complex it is, SAS software can extract relevant conclusions from it and can create the basis for reliable, forward-looking business decisions. With big data analytics, questions can be answered in a wide variety of business sectors ranging from customer and campaign management through corporate management, the control of machines and plants (Industry 4.0) to solutions for transparent dialogue between the state and its citizens (open government). Over and above this, big data analytics from SAS can reveal previously unknown patterns and relationships in the data, creating the conditions for the digital transformation of companies as well as for new digital business models. Not only can



companies quickly and reliably set strategic courses from the results, but they also can better control operational procedures. SAS high-performance analytics extensively uses the opportunities provided by Hadoop and in-memory computing to process big data both cost-effectively and extremely quickly. SAS also offers companies a platform to analyze, improve and check their data, thereby contributing to decisive improvements in data quality and data governance.

All solutions from SAS are also available as managed services so that they can be used in a public cloud, a private cloud and in hybrid cloud environments. In addition to this, SAS makes solutions available for self-service business intelligence (BI), mobile BI and for the visual presentation of data. These make it possible to derive valuable information from the data material at management level without any special knowledge of statistics and without support from the IT department. This means that the right managers and staff have the relevant information at their fingertips at the right time, wherever they happen to be.

Some background: SAS arose from a research project at North Carolina State University. The company was founded in 1976. Its headquarters are in Cary, North Carolina, USA, and it has 14,000 employees at 400 offices in 56 countries around the world. Since 1982, SAS has its German head office in Heidelberg with other offices in Berlin, Frankfurt, Hamburg, Cologne and Munich, currently employing about 550 staff.

Tableau

www.tableau.com

Company profile

Tableau's (Big) Data Strategy

[Tableau is on a mission](#) to help users see and understand their data. To accomplish this mission, our fundamental belief is in the democratization of data meaning “the people who know the data should be the ones empowered to ask questions of the data.” Everyday knowledge workers should have the ability to easily access their data wherever it may reside. These same knowledge workers should also have the ability to analyze and discover insights about their data without assistance from the elite few - the data scientists and IT developers.

Visualizing data is important regardless of the size of the data because it translates information into insight and action. The approach to visualizing Big Data is especially important because the cost of storing, preparing and querying data is much higher. Therefore, organizations must leverage well-architected data-sources and rigorously apply best practices to allow knowledge workers to query Big Data directly. Big Data has been home to a great deal of innovation in recent years - thus there are many options available, each with their different strengths. **Tableau's vision is to support any Big Data platform that becomes relevant to our users, and help them facilitate a real-time conversation with their data.**



To achieve this Big Data vision, Tableau has focused on six pillars:

- Broad access to Big Data platforms (Hadoop, NoSQL, Spark, Cloud, Operational Data, Fast Analytical Databases)
- Self-service visualization of Big Data for business
- Hybrid data architecture for optimizing query performance
- Data blending for performing analytics across data sources
- Overall platform query performance
- Powerful and homogenous visual interface to data

Learn more under: <http://www.tableau.com/solutions/big-data-analysis>

Tableau Germany GmbH
An der Welle 4
60322 Frankfurt am Main
Deutschland
+49 (0) 69 58997-6700
marketing-emea@tableau.com
www.tableau.com

Teradata

www.teradata.com

Company profile

Teradata helps companies get more value from data than any other company. Our big data analytic solutions, integrated marketing applications, and team of experts can help your company gain a sustainable competitive advantage with data. Teradata helps organizations leverage all of their data so they can know more about their customers and business and do more of what's really important. With more than 10,000 professionals in 43 countries, Teradata businesses that exploit data for insight and value. More than 2,500 customers worldwide span industries including automotive and industrial; communications; consumer goods; e-commerce; financial services; government; healthcare and life sciences; hospitality and gaming; insurance; manufacturing; media and entertainment; oil and gas; retail; transportation, distribution, and logistics; travel; and utilities.

A future-focused company, Teradata has driven innovation for thirty-five years. Teradata's work-



load-specific platforms integrate an organization's data into a unified view of the business. Our database software includes the unparalleled Teradata® Database, and, for big data analytics, the Teradata Aster® Discovery Platform and Hadoop Portfolio. The unique Teradata Unified Data Architecture™ helps customers discover and operationalize insights by integrating multiple technologies, including Hadoop, into a robust, hybrid architecture. Teradata's marketing and analytic applications—available on premise or in the cloud – leverage data to improve marketing effectiveness, determine profitability, and forecast demand. These powerful solutions, along with years of hands-on experience working with the world's leading enterprises, enable customers to maximize the value of their data and serve their customers better. Teradata is recognized for technological excellence, sustainability, corporate social responsibility, ethics, and business value.

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Business Application Research Center – BARC GmbH

Central Europe

Berliner Platz 7
97080 Würzburg
Germany

+49 931 880651-0

www.barc.de

Rest of the World

+44 1536 772 451

www.barc-research.com