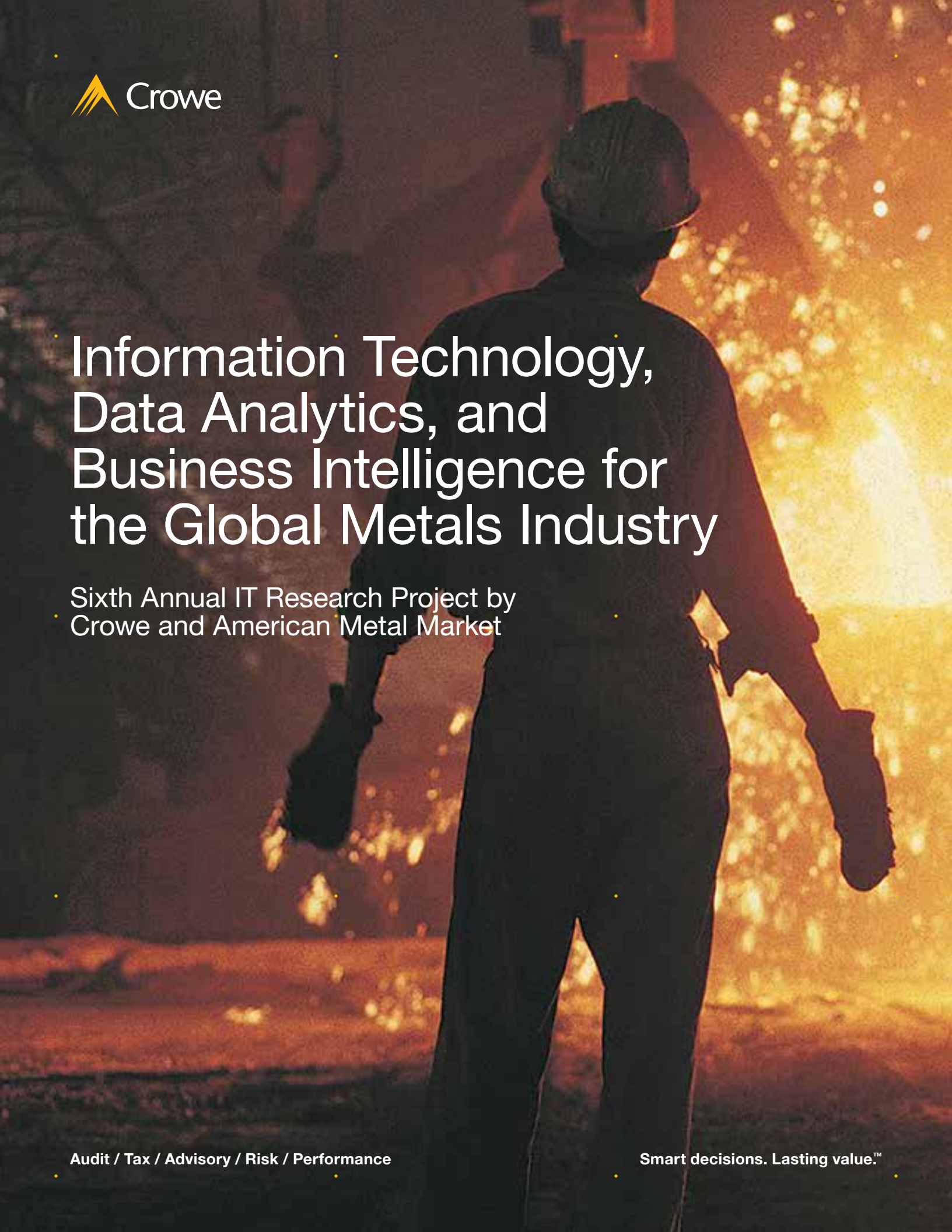

Crowe

Information Technology, Data Analytics, and Business Intelligence for the Global Metals Industry

Sixth Annual IT Research Project by Crowe and American Metal Market

Audit / Tax / Advisory / Risk / Performance

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In the spring of 2017, Crowe, in collaboration with American Metal Market, conducted its sixth annual survey of metals industry executives to examine the role of information technology in the global metals industry.

This year's online survey elicited responses from high-level executives at companies ranging in size from less than $50 million to more than $1 billion in annual revenue. The respondents represented a cross section of metals-based companies including mills, producers, processors, service centers, scrap recyclers, and manufacturers. The respondents work with nearly every metal end-market, including aerospace, automotive, heavy equipment, construction, and defense, among others.

The questions in this year's survey reflected the continuing evolution of both IT and the metals industry. In addition to questions about companies' general IT priorities and practices, this year's survey also introduced questions about participants' use of advanced IT capabilities such as data analytics, business intelligence, and the "Internet of Things" – using smart devices to monitor or control equipment or perform other business functions remotely via internet connections.

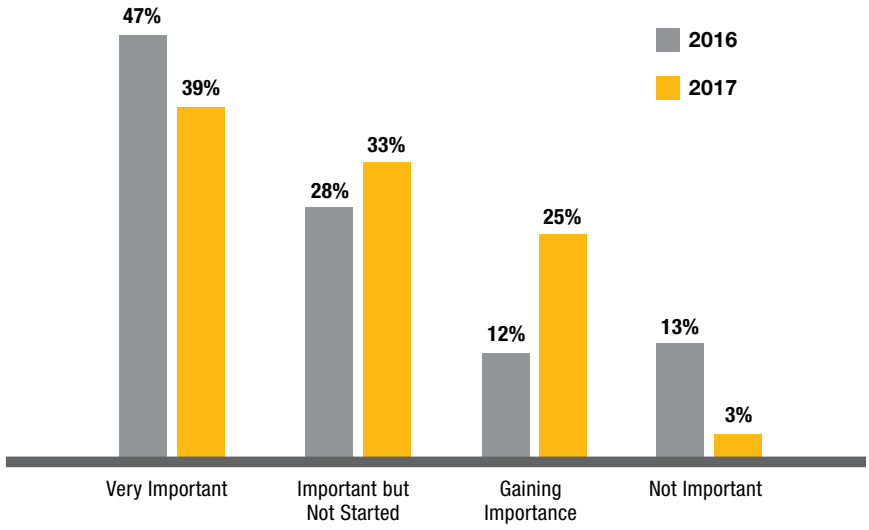
The following pages present an initial summary of survey responses, providing a snapshot of both the general state of IT in the metals industry today, and some insights into the pace at which metals companies are adopting more advanced analytical and data management strategies and technology.

1. How vital is new technology to your three- to five-year business strategy?

Key Findings and Observations:

Being able to tie IT investment to business goals strategy is crucial. When this isn't done, IT projects frequently lose momentum or get shelved permanently when a significant challenge arises or a budget commitment is required.

In 2017, the number of respondents who said IT is not important to their strategy dropped sharply from 2016 – however, the number who said they already tie IT investments to business results dropped as well. More participants this year characterized IT as gaining in importance, indicating a growing need for a technology road map that ties IT investments to business results.



Answer Options:

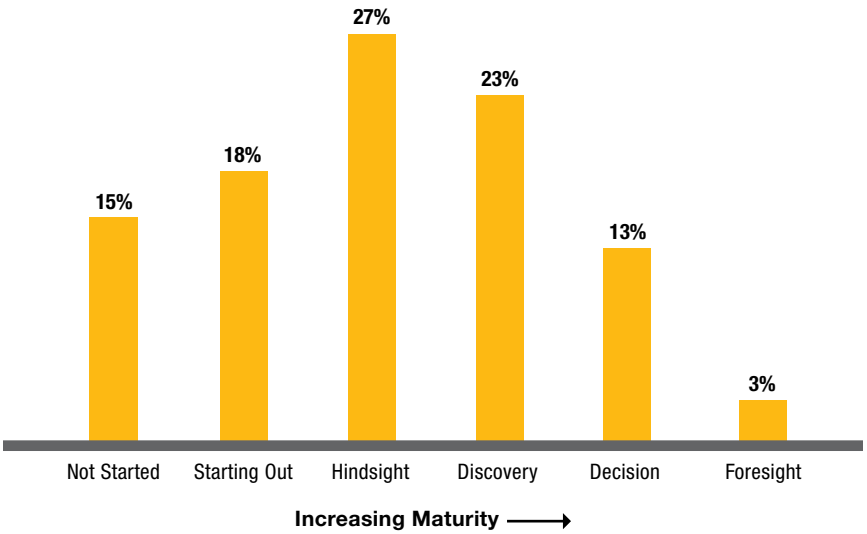
- **Very Important:** We have a technology road map that prioritizes our IT needs; our IT investments are tied to business results.
- **Important but Not Started:** We need a technology road map that ties IT investments to business results.
- **Gaining Importance:** We do not know how our current technology is impacting our business results; we have a long list of IT requests but have no way to prioritize or evaluate the effectiveness.
- **Not Important:** We are not considering IT's role in financial and operational performance.

2. How would you rate your company on the following data analytics/business intelligence (BI) maturity scale?

Key Findings and Observations:

One-third of the respondents said their companies were either just getting started using data analytics and business intelligence or had not started at all. Furthermore, while half of the companies surveyed were actively engaged in improving their use of such tools, only a small minority (16.3 percent) were at relatively advanced maturity levels.

These responses suggest there are opportunities for metals businesses to differentiate themselves by accelerating their use of advanced, predictive data analysis to improve performance and make better decisions. For an industry that can be influenced by external factors (trade regulations and currency, to name a few), understanding and predicting how changes in these external factors could affect the business will continue to grow in importance. As the bell curve depicting the industry's data analytics and BI maturity eventually becomes more symmetrical, those companies that are already pursuing such strategies can expect to have a competitive advantage.



Answer Options:

- **Not Started:** We are not sure where to start when it comes to data analytics or BI options.
- **Starting Out:** We are just beginning to explore the possibilities when it comes to data analysis and BI.
- **Hindsight:** We are at the early stage of business analytics, summarizing historical data and identifying possible relationships between customers and products or other relevant variables.
- **Discovery:** We provide our employees and analysts tools to drill down and explore data in an attempt to understand the root causes of different events.
- **Decision:** We are able to identify business actions and decisions which allow our company to take advantage of opportunities or mitigate risk.
- **Foresight:** We offer tools and techniques to make predictions about future outcomes and trends for the business, including the probability of each.

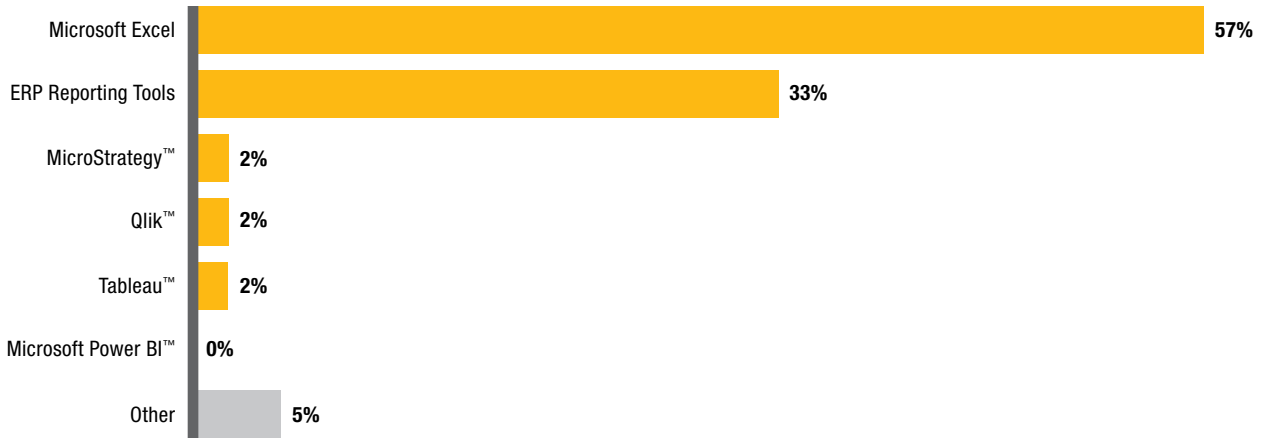
3. What is the most common tool your nontechnical employees use for data analysis and nonfinancial reporting?

Key Findings and Observations:

Familiar, user friendly, and flexible, Microsoft® Excel® software remains the most widely used data analytics tool in the business world. So it is no surprise that a solid majority of metals businesses rely on Microsoft Excel software as their primary analytical tool. While Microsoft Excel software presents a familiar interface, it presents challenges with security, controls, and manual data entry that metals companies need to consider.

What is noteworthy, however, is how few of the survey respondents are using any of today's most widely recognized dedicated analytics and business intelligence tools. This suggests that those companies that are able to adapt quickly and move beyond spreadsheets could achieve an early advantage over their competitors by engaging in more advanced, data-driven decision-making.

One more observation is about the number of companies using ERP reporting tools. This demonstrates a significant advancement in ERP technology and tools. While traditional ERP software was thought of as transactional systems, many modern ERP platforms provide best-in-class analytics tools that can provide additional value to metals companies.



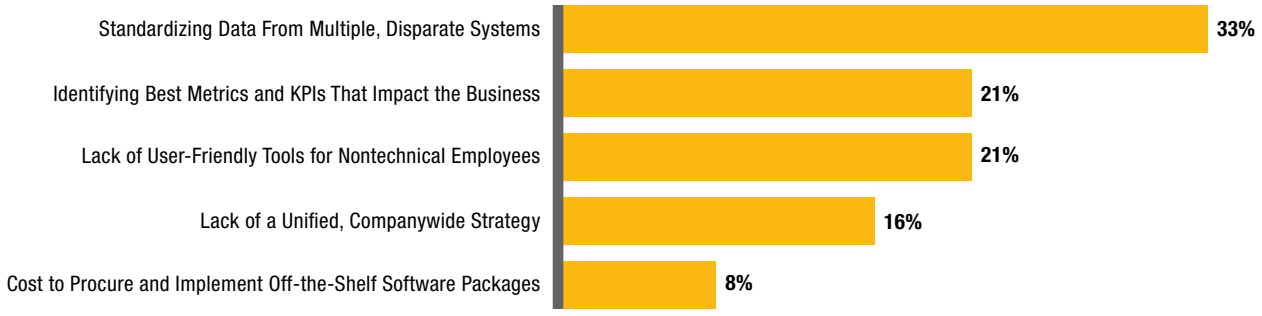
4. What is the steepest challenge for your company when it comes to data analysis and BI?

Key Findings and Observations:

The survey respondents were divided when asked to choose their biggest data analysis and BI challenges. But when these responses were cross-tabulated against the analytics and BI maturity levels identified earlier, some patterns begin to emerge.

Those companies that were still in the earlier stages of maturity were more likely to cite cost and the lack of a companywide strategy as their major challenges, while those that had achieved some level of maturity were more likely to cite the need for standardizing data, identifying best metrics, and developing user-friendly tools as their most prominent current challenges.

One somewhat surprising finding is that 21 percent of all participants were still unsure about their companies' most important metrics and key performance indicators – which suggests considerable work still needs to be done in establishing data-based decision-making processes. One area of investment for metals companies could be machine learning tools that can analyze vast quantities of data and identify potential metrics or signals that have traditionally proved to be good indicators for their business.

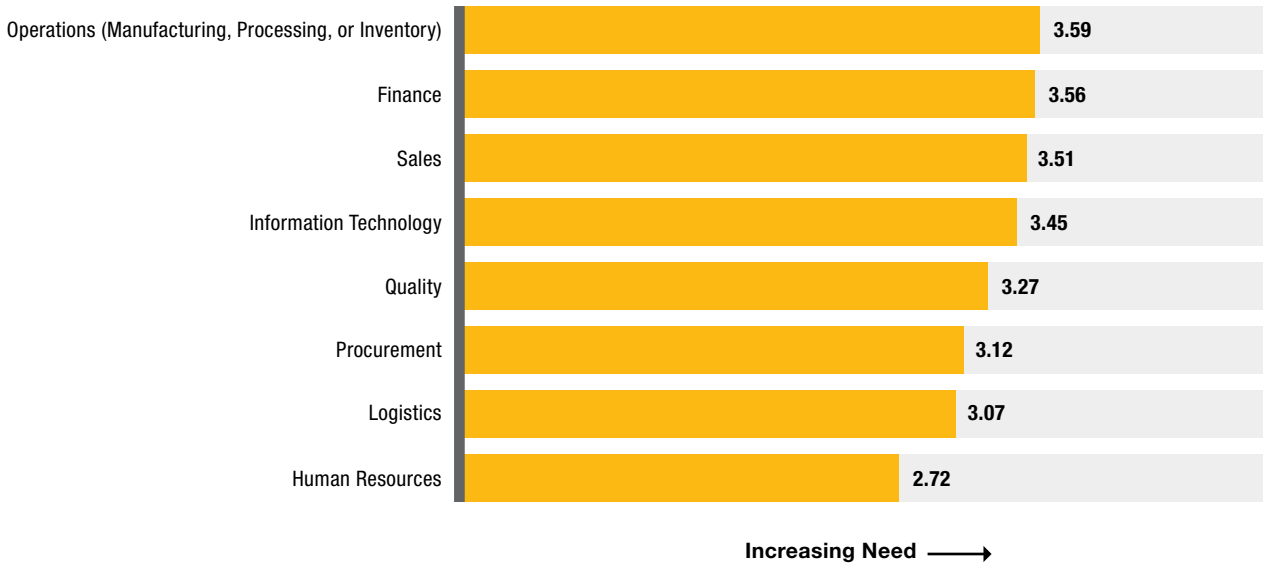


5. On a scale of 1 (none at all) to 5 (advanced, predictive analytics requests), rate each area of your company on its need for data analytics and BI to do their job.

Key Findings and Observations:

General industry patterns suggest that the business functions that are most likely to press for more and better decision-making data are sales, finance, and (in larger companies) procurement. The 2017 survey responses were generally consistent with that tendency. On the other hand, those functions where the value of data analytics is not as widely perceived could offer unrecognized opportunities to uncover greater value for the company.

As hiring and firing decisions become more critical and the competition for good employees increases, human resources could be an area of investment where metals companies could differentiate themselves from their competition.

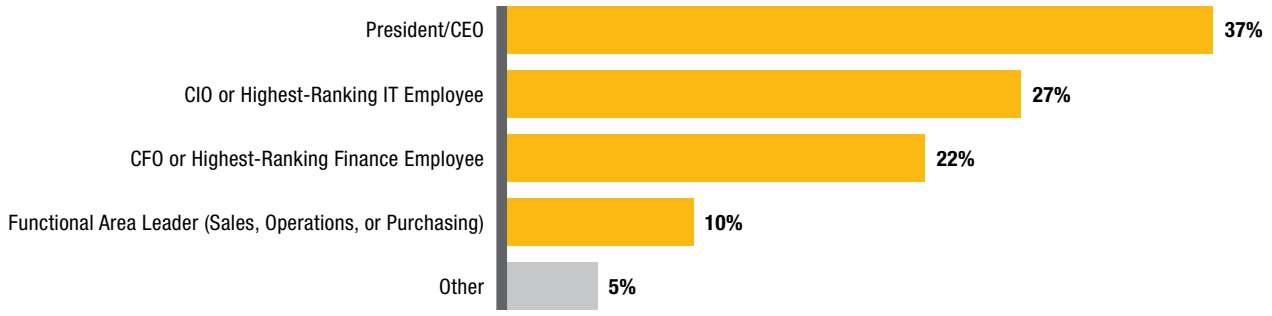


6. Who in your organization is the primary decision-maker when it comes to data analytics and BI projects or software?

Key Findings and Observations:

As is the case in most industries, the impetus for investing in data analytics and business intelligence in metals companies typically comes from the top levels of the organization. These executives are more likely to demand quick, up-to-date, and easily understood information to help them monitor the pulse of the business.

Ultimately, however, it would be desirable to see greater active involvement by functional area leaders and managers as well. This could be viewed as a sign that the corporate culture has evolved to the point where the importance of data-based decision-making is recognized and understood throughout the organization.



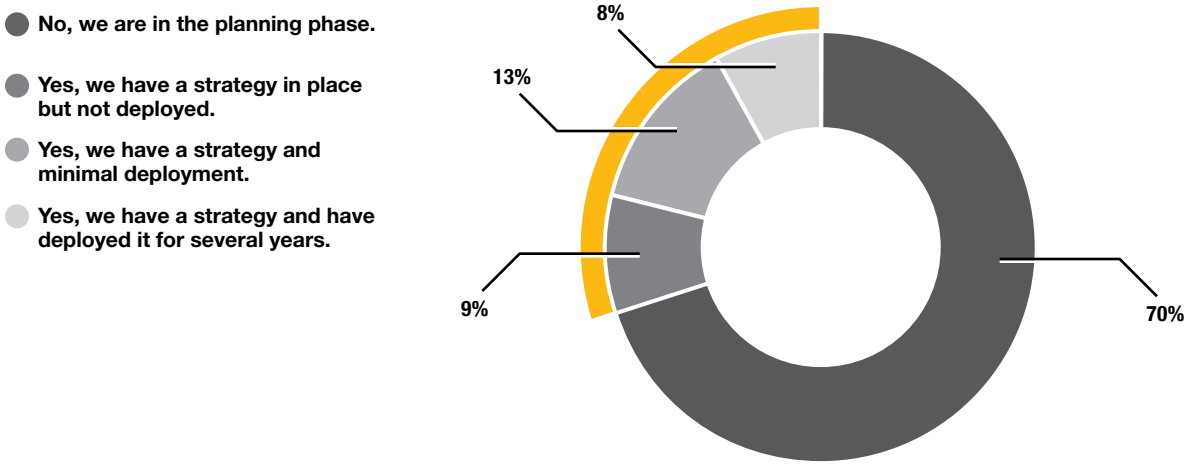
7. Do you currently have an Internet of Things (IoT) strategy?

Key Findings and Observations:

About 30 percent of the metals companies surveyed said they have an IoT strategy in some stage of development and deployment. This maturity level is in line with similar manufacturing industries.

When responses are compared across the various sectors of the industry, a general trend can be observed: Those companies that are further "downstream" in the process are more likely to have such a strategy in place than those further "upstream." More specifically, companies that are closer to the ultimate customer – such as fabricators, processors, and OEM automotive suppliers – are more likely to have an IoT strategy in place than companies such as producers, mills, and scrap processors. This trend matches a similar pattern to other historical technology advancements and the companies who have been early adopters in the metals industry.

Companies that are investing in a strategy and approach to IoT, or even discussing it at a leadership level, will be ahead of their peers when it comes to realizing the benefits and returns IoT can provide to an organization.



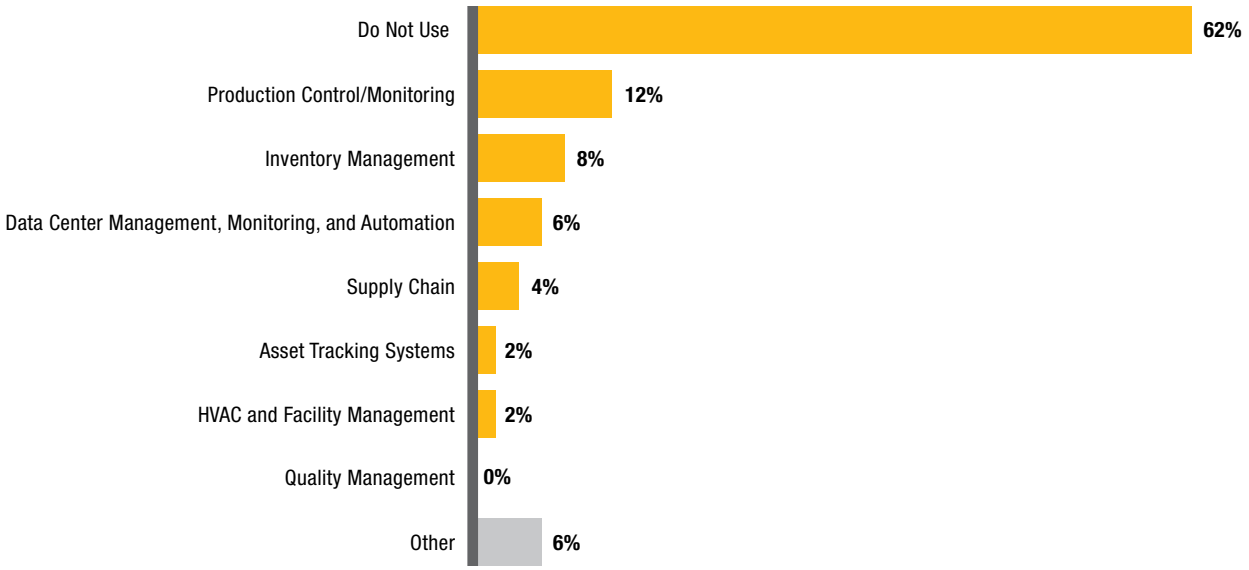
8. Does your company use IoT devices? If yes, in what area(s) of the business? (Select all that apply.)

Key Findings and Observations:

The overall responses to this question are generally consistent with the previous question, with more than 60 percent of respondents reporting they do not use IoT devices at all. In those companies that do use IoT tools, the tools are most often used for production control and monitoring purposes.

This would seem to suggest that manufacturers are missing opportunities to improve productivity and performance by using the IoT tools that are available for functions such as supply chain, inventory management, and asset tracking. This could be particularly beneficial in subsectors where heavy materials generate significant shipping and transportation costs, which IoT technology can help manage more closely.

Because IoT is in an early stage in the metals industry, there are partners and technology companies that are looking to invest with metals organization to develop and prove the benefits of this technology. Companies considering an investment should look to take advantage of these opportunities for shared investment wherever possible.

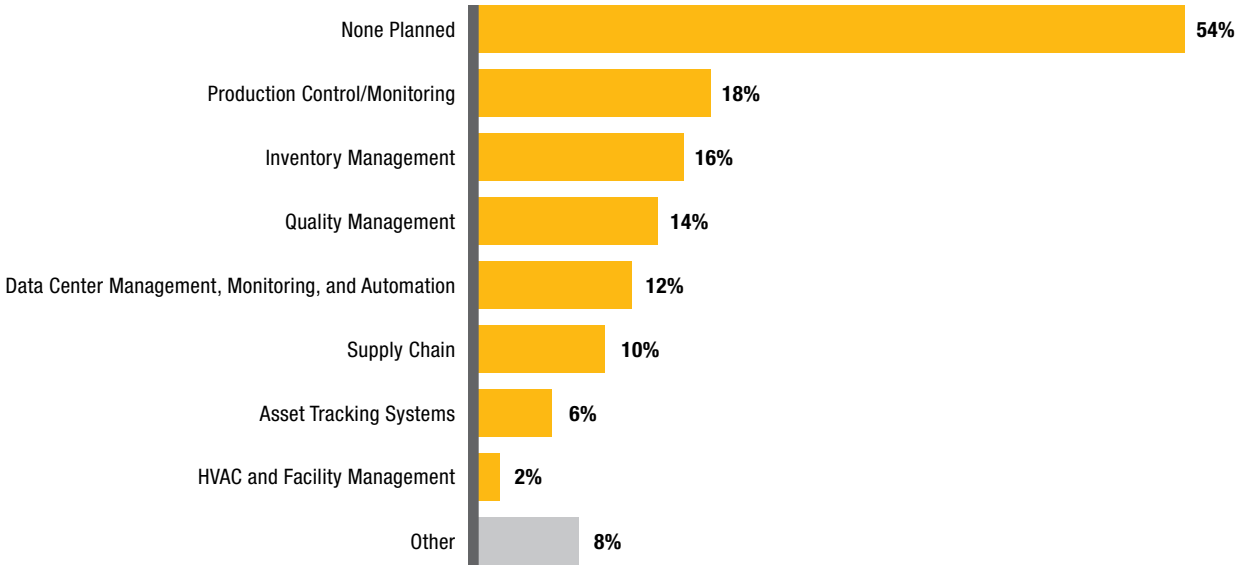


9. Does your company have a planned IoT initiative in the next 12 months? If yes, in what area(s) of the business? (Select all that apply.)

Key Findings and Observations:

These response numbers are generally higher than the previous question, which tracked current IoT usage. The higher numbers suggest the industry can anticipate a gradual increase in the use of IoT technology.

One encouraging highlight is the 14 percent of respondents who indicated that they plan to introduce IoT technology into quality management – an area where the previous responses indicate it has not yet been applied to any significant degree. This suggests companies are recognizing opportunities to improve quality control and quality management.

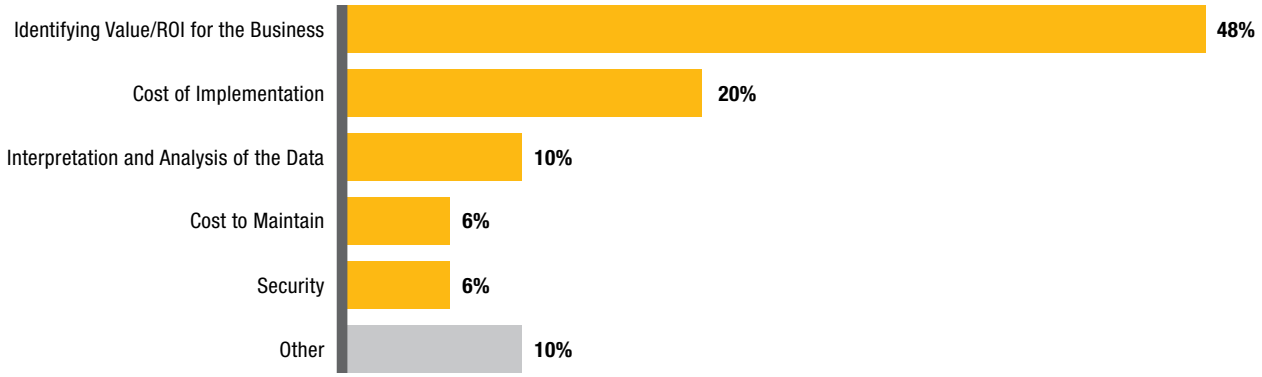


10. Select the steepest challenge when it comes to current IoT uses or planned IoT initiatives.

Key Findings and Observations:

The leading IoT challenges that metals companies perceived were identifying ROI and managing implementation costs. The two concepts are obviously related.

It is significant that only a very small number of responses identified security as a leading challenge. This is a somewhat surprising development in view of the large number of high-profile data breaches that have been reported in recent years due to gaps in device security. Companies engaged in IoT initiatives should take proactive steps to protect sensitive business and customer data from unauthorized access and unwanted exposure.

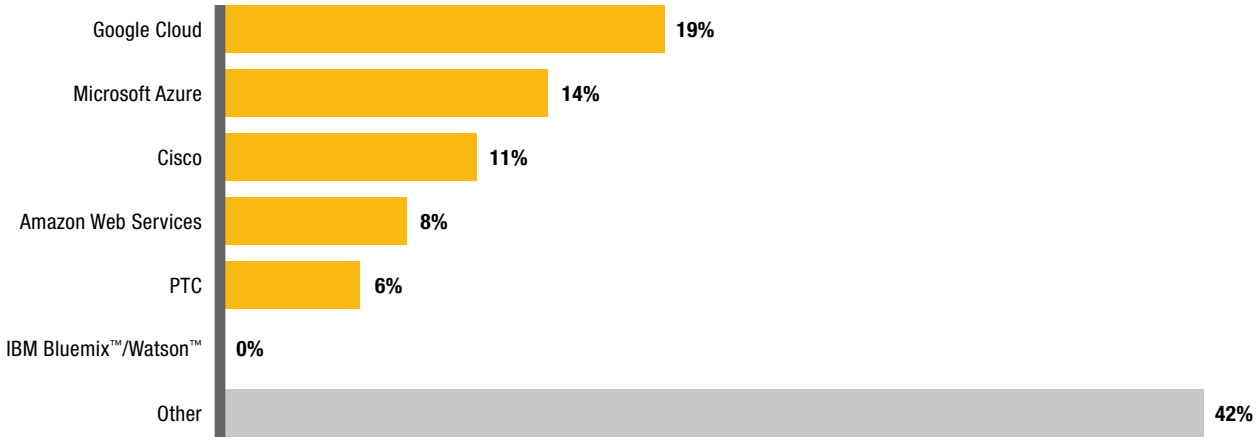


11. Does your organization utilize a cloud platform for the ingestion and processing of data from IoT devices?

Key Findings and Observations:

The responses to this question suggest significant opportunities for companies to improve performance and differentiate themselves from competitors. Outsourcing data center operations – just like outsourcing payroll and other administrative functions – can free up resources and allow companies to focus on their core business.

As cloud computing becomes more commonplace in manufacturing and costs continue to plummet for computing power, more and more metals companies will benefit from the cloud platforms available to them. It is interesting to note that Amazon Web Services is generally considered to be the top cloud service provider but ranks fourth in our survey respondents' usage, behind Google Cloud, Microsoft Azure™, and Cisco™ solutions.

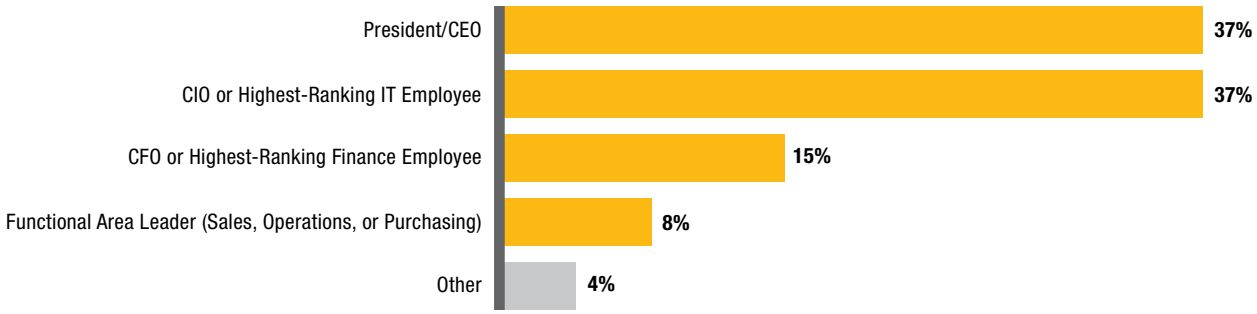


12. Who in your organization is the primary decision-maker when it comes to IoT projects or software?

Key Findings and Observations:

Just as respondents indicated for data analytics and BI decisions, CEOs often take a leading role in driving IoT projects and software implementation. On the other hand, IT executives are equally likely to play a leading role in IoT decisions, which was not the case in data analytics and BI decisions (see question 6).

These differences are not surprising, given that IoT technology is generally less well-known or understood and is not as widely deployed as analytics software. As a result, CEOs more actively sought the guidance of IT executives when making IoT decisions. In addition, an IoT project often includes an additional level of involvement from IT to support and maintain the program in the long run. This support can require new skill sets or additional resources for which a CIO must be prepared.



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For more information, or to request additional copies of this survey report, please contact:

Frank Collins
+1 404 442 1661
frank.collins@crowe.com

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