

DECISION MANAGEMENT SOLUTIONS

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Predictive Analytics in the Cloud

Opportunities, Trends and the Impact of Big Data 2013

Predictive Analytics in the Cloud is a fast growing market with products that deliver significant impact for companies in every industry by improving customer results and leveraging Big Data.

In the last few years predictive analytics has become a mainstream topic. Companies and organizations of every size and in every industry are looking at their data to see if they can use it to make predictions that will help them be more effective, more customer-centric and more profitable. The rise of Big Data as a topic—the focus on data that is more volumnious, comes in more varieties and arrives more quickly has sharpened this focus on predictive analytics. New varieties of data

create new analytic opportunties while the increases in volume and velocity create new challenges.

> At the same time the focus of many companies' IT investment has shifted from buying and installing onpremise hardware and software to buying cloudbased services. Starting with CRM Software as a Service and expanding to new software solution areas and to platforms, infrastructure and even data as a service, cloud has in many ways become the default platform for IT.

Organizations want to know how to respond to these various trends. They want to understand how they can use predictive analytics and the cloud in combination. They want to understand the impact of Big Data on their technology choices. They want to know if they should start now or wait for others to try it first. They want to know what opportunities exist with predictive analyitcs in the cloud, what trends exist and what impct Big Data has on their choices.

This report, sposnored by FICO, Lityx and SAP, summarizes extensive research and survey results conducted in Fall 2013 to address these questions.



Lityx



Predictive Analytics in the Cloud

Predictive Analytics is short hand for developing mathematical models, algorithms that make predictions, by applying a wide variety of mathematical techniques to historical data. These models can show patterns of association or clustering in the data, assess the likelihood that something is true or statistically significant, or assign a range of likely values to some point in the future.

Predictive Analytics turn uncertainty about the future into a usable probability

Predictive analytic models are developed and used to predict risk, fraud, opportunity and demand:

- How risky is this deal?
- How likely is this claim to be fraudulent?
- What will maximize this customer's profitability?
- How much demand is there likely to be in the future for this product?

Many different techniques can be applied to an increasingly wide range of data. This data might be an organization's own data or data from external sources. As we enter the era of "Big Data," increasing amounts of data, both structured and unstructured, are available for analysis. Gaining actionable insight from all this data is a business necessity. Using predictive analytics to generate this insight and then using it to improve the quality of decision-making creates value in organizations of every size and in every industry.

It's almost hard to remember but it used to be that almost all computing resources were installed, configured and managed within an organization. While externally hosted and shared resources were available back even into the 80's, the scope of these resources was constrained by custom interfaces and unique protocols. The explosion of the cloud to deliver computing resources as a service in the last few years means that organizations can buy their platform software, data, applications and infrastructure as a service. They can pay for these resources as they use them, with transaction or usage based pricing. They may have dedicated resources but will likely share all or some resources in a multi-tenant environment so that resources can be dynamically allocated between users as needed. API or browser-based access from anywhere allows for location transparency while service level agreements define the level of reliability and performance to be delivered from this pool of shared resources.

When these two approaches and technologies come together we get Predictive Analytics in the Cloud. The combination allows predictive analytics to be more scalable, more pervasive and easier to deploy. It uses the advantages of the cloud to improve the ROI and time to market of the most advanced analytics.

Executive Summary

The results of the 2013 Predictive Analytics in the Cloud Research are clear. Predictive analytics in the cloud is becoming mainstream, with broader and accelerating adoption. This adoption is increasingly driven by the value of predictive analytics to improve customer treatment and engagement. As organizations gain more experience with predictive analytics their approach to data and to Big Data is changing and evolving. First movers and organizations embedding predictive analytics in their operational systems are moving ahead and transforming their business.

"The current and planned adoption of cloud-based apps and services suggest we're at a watershed for widespread predictive analytic adoption, investment and deployment."

Jim Ericson, Editorial Director Information Management

Predictive Analytics in the Cloud Becoming Mainstream

The number of companies reporting a positive impact from predictive analytics has risen dramatically since the 2011 Predictive Analytics in the Cloud research study.

For instance, over 60% of survey respondents said they were using at least one kind of predictive analytics in the cloud. Over 90% said it was likely they would have at least one class of solution widely deployed in the next few years. Half of all respondents thought that all three of the use cases discussed—pre-packaged cloudbased decision solutions, building predictive analytics in the cloud and using the cloud to deploy predictive analytics—would be widely deployed in that period.

Not only are organizations deploying predictive analytics in the cloud, this deployment appears to be accelerating. Compared with 2011 all three of these use cases showed at least a 50% increase in reported deployment. All three also showed smaller but still significant increases in the likelihood of future deployment.

Most of these future plans are relatively near term with 60% reporting either ongoing deployment or plans for deployment in the next 24 months. These immediate plans are strongly focused on internal clouds. While other cloud types are likely to be a part of the overall solution, it was private cloud infrastructure that was by far the most likely to be central to deployment plans.

"Cloud-based analytics platforms are a perfect opportunity to bring advanced analytics to the business user. Ease of access, development, and implementation of predictive analytics and marketing optimization are exactly what our clients are after. Our cloud platform enables it."

Paul Maiste , President and CEO, Lityx

The top driver for all this activity was reduced cost. It used to be the case that advanced analytic applications were very high ROI but also very high cost. This tended to make them an option only for serious problems and large organizations. Because of this cost barrier there has been constant pressure on the market to deliver solutions more cost effectively. This is clearly driving cloud deployments of predictive analytics. Reduced time to value and increased agility play their part too but the high-cost, high-return history of predictive analytics is clearly putting the focus on reducing costs.

What holds organizations back is predictable. Data security and privacy, along with regulatory and compliance concerns, remain the primary obstacles reported. These concerns drive the preference for private clouds, as such clouds are reported as easier to manage in these areas.

Predictive Analytics Drive Customer Value

Two thirds of respondents have seen a positive impact from using predictive analytics in their business with 43% reporting a significant or transformative impact.

This impact is growing. From 2011 to 2013 there has been an increase of well over 50% in those reporting a positive impact from predictive analytics. This is matched by significant decreases in those who are not using predictive analytics yet and in those who have no plans to do so.

The dominant use of predictive analytics among respondents was in customer engagement. When asked which areas had been positively impacted by predictive analytics, 4 of the top 6 areas related to customers. In particular customer satisfaction, customer profitability, customer retention and customer management. This focus on customers was also specifically around improved customer satisfaction (the single most selected response) rather than around marketing or selling to customers. While the use of predictive analytics in marketing and cross-sell/up-sell is important, the clear message of the study was that customer management and engagement can be improved using predictive analytics too.

"Businesses need to find a new way to engage with their customers or risk becoming uncompetitive. They need to build, customize and deploy analytics that help them not only understand their customers, but delight them. This is why FICO is giving businesses cloud-based access to our full set of analytics and decision management tools and applications for transforming social and mobile customer engagement."

Stuart Wells, CTO, FICO

The Coming of Big Data

More experienced and more successful analytic teams show much higher usage of "Big Data" data types today than in 2011. Social Media, Sensor, Weblog, Audio and Image data types are all rated as much more important in analytic models among those with successful analytic deployments. With more successful, more established teams using Big Data more broadly it seems likely that there will soon be a rapid and significant growth in the use of new data types in building predictive analytics.

However more traditional structured data remains broadly central to effective predictive analytic models. As was seen in 2011, structured data continues to be considered far more important than any other kind. An organization's own unstructured data is playing a larger role in predictive analytics but most organizations are doing little yet with more esoteric data types.

There is also a lot of future interest in Big Data. Respondents are expecting these data types to matter more in the future than they do today. While this could just be due to respondents hearing marketing messages it seems likely that there is more to it than that.

The volume of data being analyzed for predictive analytics has not increased much in other surveys such as the Rexer Data Mining Survey. This seems about to change, however, as analytic teams increasingly talk about forgoing sampling and analyzing all their data. This increase in volume will have an impact but this is not yet visible.

The velocity of data also matters. Predictive analytics is increasingly focused on near real-time, operational data. While batch and static data are still very important, it is near real-time data from operational databases that grew the most between 2011 and 2013. This reflects a general shift in using predictive analytics. The use of predictive analytics is moving from batch scoring to real-time scoring. Where organizations used to apply predictive analytics to their whole database overnight they are increasingly scoring each customer or transaction at the moment they need the score. This change is reflected in the increased use of intra-day and real-time data. In addition, while some are scoring true real-time data—streaming data—this is not yet a mainstream use case.

"SAP Predictive Analytics Cloud Solution powered by SAP HANA and combined with SAP Data Science services delivers across the five dimensions of decision processing: breadth, depth, high-speed, real time and simplicity. This powerful combination delivers on the business imperative of predictive analytics in real time with the simplicity of the cloud."

Tony Collura, Director SAP Data Science

Maximize Value: Start Now, Adopt Decision Management

Over 95% of survey respondents who reported tightly integrating predictive analytics into operations also reported transformative or significant impact. Furthermore the percentage reporting such integration has risen significantly since 2011 helping to explain the overall increase in impact observed. Decision Management, with its systematic embedding of predictive analytics into automated decision-making systems, is an ideal approach to maximize the transformative power of predictive analytics.

In 2011 it was clear that those adopting predictive analytics, early adopters, were going to get an edge. They were more likely to have plans for broader deployment and saw the solutions as more valuable. Exposure to predictive analytics in the cloud bred enthusiasm. There was no "trough of disillusionment" and those who bought into the promise of predictive analytics and got started liked the results and wanted to do more.

This trend strongly repeated in 2013. Once again, early adopters with one or more use cases deployed were significantly more likely to have plans to expand deployment. Similarly those with experience were likely to rate the value of each scenario more highly. Using predictive analytics in the cloud clearly results in increased enthusiasm for cloud-based predictive analytic solutions and a positive view of their impact. As in 2011 this suggests that organizations that get started have the opportunity to create differentiation from slower moving competitors.

The next six sections outline these conclusions in more detail. A section on plans makes suggestions for actions companies should take now and the report concludes with information from the sponsors and a demographic summary.

Predictive Analytics Matters

One of the most important questions for any technology, any approach, is whether it actually makes a difference. The survey began by asking how much impact respondents had seen from predictive analytics in their organization. As we can see in Figure 1, two thirds of respondents have seen a real, positive impact from predictive analytics. Fully 43% of respondents report a significant or transformative impact.



Figure 1: Overall impact from Predictive Analytics

Comparing 2013 to 2011 in Figure 2 there has been an increase of well over 50% overall in those reporting some, significant or transformative impact. There is a similar increase in those who have begun or completed implementation with a matching drop in those with no work underway.

Figure 2: Significant increase in impact since 2011



In 2011 our research report was titled "Cloud-based predictive analytics poised for rapid growth" and the results of the 2013 survey bear this out. Both impact and adoption have increased rapidly in the two year since the first survey.



as it has a long history with predictive analytics while the retail sector has made significant investments in recent years.

"[There is] still much user resistance to using [the] results of analytics. People still believe in superiority of human judgment"

Survey Respondent

Laggards included the Insurance, Healthcare and Telecommunications industries. Insurance companies are beginning to invest in predictive analytics while the enthusiasm for predictive analytics in health care is balanced by concerns and challenges around data privacy and organizational change. The laggard status of Telecommunications was a little bit of a surprise as Telecommunications companies feature widely in predictive analytics success stories. It is true that most of these stories are in the call center/customer service space so it is possible that the respondents were from the operations and delivery organizations where success is less widespread.

A Focus on Customers

As in 2011 the key area of focus for predictive analytics among this year's respondents is the customer. When asked to list the areas in which they applied predictive analytics, respondents clearly identified customers as their number one area of focus. With respondents allowed to select multiple areas in which they were seeing an impact from predictive analytics, four of the top six areas selected were about customers (see Figure 6 for a full breakdown) while the other two were about customer acquisition.

In fact when the detailed categories were summarized into different areas of focus, Customer Analytics came out a clear winner as shown in Figure 4. Optimization of various kinds—supply chain optimization, business optimization, marketing optimization— was second with risk/fraud and marketing also being widely identified as places where predictive analytics were making a difference.

"Organizations are looking to upgrade their customer churn and lifetime customer value models with a real time predictive view of customer satisfaction."

Jim Ericson, Editorial Director, Information Management

While all the industries with a significant number of respondents put customer analytics first there was some variation regarding the second broad category. Retail, Manufacturing and Hardware/Software put Optimization second reflecting their focus on supply chains. Financial Services, Insurance and Healthcare all had Risk second. This focus on risk is not surprising in Financial Services and Insurance, nor even perhaps in Healthcare.

Figure 4: Categories of Analytic Outcomes



Within the overall topics of customer analytics the detailed results were also interesting as shown in Figure 5. In particular there was a strong focus on customer satisfaction. This significantly exceeded popular areas such as customer profitability, customer retention/churn and sales to customers through cross-sell and up-sell. Customer management also showed strong results. This is a clear sign that companies are using predictive analytics to engage their customers not just sell to them. Predictive analytics are helping companies build stronger, more long-lasting customer relationships.

Figure 5: Areas of Customer Focus



There were a very wide range of specific areas cited by respondents for using predictive analytics to improve business results. A selection follows:

- Actuarial models on catastrophe impact
- Capital adequacy models
- Anticipating health plan resource utilization
- Claims fraud detection in the call center
- Customer buying patterns
- Collections strategies
- Planning and scheduling optimization
- Reducing financial crimes
- Operational risk in aviation safety
- Optimization of the level of care
- Propensity to buy across product categories
- Targeting customers during a web journey
- Allocating budgets effectively
- Predicting water yield from satellite data

Figure 6: Detailed Breakdown of Analytic Outcomes



Broad Adoption of All Three Use Cases

The value proposition of Predictive Analytics in the Cloud is based on four pillars:

Scalability.

The use of the cloud allows for compute and data resources to be scaled up as needed. Use of cloud-based resources makes this easy and cost-effective.

Pervasiveness.

The always-on, available everywhere nature of cloud-based systems increases the pervasiveness of predictive analytics in an organization, allowing more problems to be addressed and greater advantage to be taken of predictive analytic solutions.

Deployment agility.

Deploying predictive analytics is a critical challenge for many organizations. Using the cloud as a primary deployment platform reduces the time and cost to deploy predictive analytics and increases agility.

• Move analytics to the data.

More and more data is in the cloud so predictive analytic solutions that are similarly cloud-based are able to bring analytic processing to the data for increased efficiency and lower latency.

These pillars support three primary use cases for Predictive Analytics in the Cloud. Many solutions combine elements of all three use cases. The value a predictive analytics in the cloud solution offers comes from a combination of them:

Pre-packaged cloud-based solutions.
 A complete decision-making solution that embeds predictive analytics and

delivers decisions using the cloud—Decisions as a Service.

- Cloud-based predictive modeling.
 Moving the creation of predictive analytic models to the cloud to take advantage of scalable processing and to be closer to the data required for the model.
- Cloud-based deployment of predictive analytics.
 Using the cloud to deploy predictive analytic models and so make these analytics more pervasive in an organization.

Broad Adoption and Impact

Respondents were asked about the three use cases and asked to say how widespread current adoption of each use case was, how likely future adoption was for each, and how important each use case was to their organization. While there was some variation in the responses across the three use cases, overall they were similarly widespread, had similar future adoption rates and were considered of similar importance. "The greatest benefit of cloud-based analytics resides in lowering the barrier to entry for experimentation. As happened with other software solutions, this will result in a democratization of analytics and in more widespread adoption, especially for SMB."

Andrea Scarso, Founder MoneyFarm.com

To see how widely predictive analytics in the cloud is currently deployed, and how likely future deployment is, responses were collated across all three use cases. As shown in Figure 7, over 60% of respondents said they had at least one use case very or somewhat widely deployed. Nearly **90%** of respondents think that at least one scenario is likely to be deployed in the near future with over half of all respondents thinking that all three are likely to be deployed.

Figure 7: Overall Deployment and Intent



As noted there was very little variation between adoption rates or importance across the three scenarios. This probably reflects the fact that many solutions have elements of multiple use cases and that many respondents therefore see these use cases as minor variations within the overall theme of Predictive Analytics in the Cloud. That said there were some small but distinct variations:

Pre-packaged decision making solutions were slightly more widespread than the other use cases.

53% of respondents reported that this use case was widely or somewhat widely deployed against an average of 47% across all three use cases. This reflects the lower barriers to entry of these solutions as well as their value as first steps in predictive analytics.

- Cloud-based embedding of analytics had a slightly lower perceived value.
 While there was not a large difference—70% said this use case was very or somewhat valuable against an average of 76%—it was noticeable. This probably reflects an ongoing lack of focus on deployment across predictive analytics more generally.
- Cloud-based modeling was slightly more likely to be adopted in the future.
 Respondents said that the adoption of cloud-based construction of predictive

analytics models was more likely in the future than the other scenarios with 77% saying it was very or somewhat likely against 70% for the other use cases. This mostly reflects slower adoption to date as it was the least widely adopted scenario in 2011 (see Figure 8).

The dollar impact and ROI of pre-packaged solutions seems likely to be most significant of the three thanks to its closer alignment with specific business problems. As noted the use of cloud-based analytic modeling is growing rapidly. It seems likely that the slightly weaker results of cloud-based embedding are temporary, however. As more predictive models get built in the cloud, and more models get built in general, the need to operationalize them and embed them will only grow.

Increasing Impact

Across all three use cases it is clear that there has been a significant increase in both the degree of adoption and in the likelihood of future adoption from 2011 to 2013. Figure 8 shows that each scenario is significantly more widely adopted in 2013 than it was in 2011 with all three use cases seeing increases of 50% or more in the rate of respondents reporting them as very or somewhat widely deployed.

Figure 8: Increase in Current Deployment of Use Cases



Similarly all three showed a significant increase in the likelihood of future deployment as shown in Figure 9.

Figure 9: Increase in Future Deployment of Use Cases



Interestingly Figure 10 shows that the importance of the use cases has changed little with just small increases in the perceived value of pre-packaged solutions and cloud-based modeling.

Figure 10: Increase in Importance of Use Cases



"In the past 2 years we see almost a doubling in the number of analytic people who report using cloud computing for a portion of their analytics:"

Karl Rexer, President Rexer Analytics

In the context of future plans for the cloud, respondents were asked how soon they expected to deploy Predictive Analytics in the cloud. Overall 16% said there were already using the cloud and another 44% said they planned to deploy or finish deploying within 24 months. Figure 11 shows the detailed breakdown of this timing.





There was little variation between the three use cases but, as noted above, prepackaged applications are slightly more widely deployed and companies are slightly more likely to be planning to deploy modeling in the cloud within 24 months.

Different Cloud Types Have a Role

All three use cases can take advantage of a variety of cloud platforms. They can be used on internal clouds where organizations own all the hardware and software involved but share it across multiple projects and solutions. They can be used on private clouds where third parties manage the cloud infrastructure but where it is again not shared across multiple clients. Public and community clouds, where hardware is shared between many client organizations, as well as various hybrid approaches are all available. Respondents are using all these approaches to deploy predictive analytics in the cloud as shown in Figure 12.

"Private and managed clouds continue to grow as preferred platforms for cloud-based analytics, as organization seek greater security and stability of their applications."

Louis Columbus, Technology Columnist, Forbes.com

Of all these approaches, respondents clearly preferred internal clouds. Because internal clouds come without some of the privacy and regulatory concerns of other cloud types and because they make it easier to combine on-premise data with cloud data, internal clouds have much to offer.

Organizations are clearly also considering private clouds, especially those managed by vendors, as well as hybrid clouds as part of their overall predictive analytics in the cloud solution stack.

Even public and community clouds were part of the plans of over half of respondents, despite concerns about security, performance and compliance.



Figure 12: Importance of different cloud types

Pre-packaged Cloud-based Solutions

Pre-packaged cloud-based solutions are business solutions and not infrastructure. They make or enable specific decisions that can be described in business terms. They use predictive analytic models to make these decisions more accurate and the predictive analytic models are embedded within a solution framework so that the customer gets better decisions not simply predictions.

For example a multi-channel cross-sell solution decides which product to offer as a cross sell to customers in different channels. This is based on predictive analytic models that predict how likely it is that the customer in question will buy each product and on rules and policies regarding how and when the products are sold.

The predictive analytic models involved are provided to the end customer—they are not required to build their own models. These models may be built automatically by software embedded in the solution or be built by the solution provider directly.

Such offerings generally offer a rapid time to value with little need for configuration, integration or modeling before value is realized. There is generally little or no need for the business to understand either predictive analytics or the cloud. Everything is packaged up into a solution with simple interfaces for both installation and usage. These solutions are central to increasing the reach of predictive analytics, spreading the benefits to organizations that were previously excluded from the predictive analytics market.

A for-profit education business has adopted predictive analytics in the cloud to improve its lead quality. The focus is on improving its ability to tell who is likely to become a lead and who is likely to actually enroll. Predictions are used to segment potential customers and to decide what to say to a prospective lead. Using a solution that combined elements of two use cases (part pre-packaged solution, part cloud-based analytic modeling), the company has substantially increased the percentage of leads that convert. Success in this project relied not on exotic new data types but on being able to integrate all the existing data sources, rapidly iterate and explore, and on the solution's embedded analytic capability.

Figure 13 shows how these solutions are viewed by respondents. While not yet terribly widespread in organizations they are perceived as potentially important to the organization and likely to be at least somewhat widely deployed in the future.

Survey respondents clearly value the ease of adoption and lower total cost of ownership typically associated with these solutions. While plans for adoption varied depending on the specifics, there were concerns about flexibility and an ability to customize these solutions and adapt them in response to rapidly changing situations.



Figure 13: View of Pre-packaged Solutions

Cloud-based Predictive Modeling

As companies use more and more SaaS applications, a greater percentage of the data they use and manage is already in the cloud. For example web analytic data, credit bureau data and social media data as well as CRM and sales transaction data. In addition social media and other new data sources are often available only through the cloud. Cloud-based predictive modeling solutions pull all the data available in SaaS applications as well as third party web services into a cloud-based data management and modeling environment so models can be built against it.

In addition, cloud-based predictive modeling takes advantage of the scalability and on-demand nature of cloud computing. Building predictive analytic models requires widely variable amounts of compute power during the process. An elastic cloudbased platform allows the amount of compute power dedicated to a particular modeling effort to vary appropriately and offers potentially infinite scaling for large and complex problems. Cloud-based modeling solutions make it easy to add and provision new hardware as needed for modeling activities rather than requiring a pre-defined amount of hardware to be purchased, provisioned and configured. For instance when large datasets must be analyzed or when complex simulations are required to produce predictive analytic models, the team will need a lot more processing power then when they are analyzing results or investigating the data.

"Predictive analytics in the cloud is enabling customers to quickly scale resources and infrastructure and deliver efficient deployment of use cases and solutions; while providing the customer the flexibility to have the right mix of cloud, hosted, and on-premise technology based on their business and IT needs."

Chandran Saravana, Senior Director, Advanced Analytics SAP

Today most cloud-based modeling solutions are focused on scaling internal resources more effectively. One longer term trend in this space is the development of more general purpose cloud-based analytics solutions that allow organizations to use predictive analytics on problems that would exceed their own internal resources. This kind of analytics as a service offering may combine hardware and software, machine learning and other automated modeling approaches, as well as remote analytic professionals.

Modelers (data scientists) are a key and constrained resource in most organizations. Using elastic compute resources can ensure they get their results more quickly without having to invest in all the compute power they might need at a particular moment. The ability of elastic compute power to deliver rapid results without dedicated hardware keeps costs manageable while still supporting the kind of rapid iteration that is so important for good models.

Figure 14 shows how these solutions are viewed by respondents. These solutions are not widespread today in organizations but they are widely perceived as potentially important to the organization and 50% consider them likely to be at least somewhat widely deployed in the future.

Survey respondents noted particular concerns around security in this section, especially about putting proprietary data into the cloud. For this reason there was a strong thread of only considering private cloud solutions (see also Different Cloud Types Have a Role). Many were already committed to an on-premise approach to developing models while others saw a hybrid approach combining on-premise and cloud-based modeling in their future.



Figure 14: View of cloud-based analytic modeling

One trend of note here is the growing importance of the open source modeling language R. This is now used by perhaps as many as 70% of those working in predictive analytics. As more solutions offer cloud-based solutions around R this may accelerate adoption of cloud-based analytic modeling.

Cloud-based Deployment of Predictive Analytics

Operational systems are where companies are seeing the greatest payback on their predictive analytic investments (see Decision Management below). The ability to package up predictive analytics in cloud-based services to enhance an organization's existing systems can lower barriers to predictive analytics deployment. Un-deployed

models represent lost opportunity. Both the pervasiveness of cloud-based solutions and the ease with which applications can be connected to the cloud mean that a cloud-based deployment approach may significantly increase the effective use of predictive analytic models. In addition companies are increasingly investing in SaaS offerings for their operational systems. A cloud-based predictive analytics solution is the most effective way to embed more advanced analytics into these cloud-based operational systems also.

One European bank adopted a cloud-deployed model to predict the Probability of Default (PD) for residential mortgages during the origination process. This model, developed on-premise, has been deployed in a real-time engine on a private cloud. This allowed the model to be included in an origination process that orchestrated different services inside and outside the bank.

Solutions could be specific to a particular kind of predictive analytic model or a particular domain, or they could offer a more general purpose capability. A cloud-based approach is likely to be an effective solution in part because of the difficulty of embedding models in multiple applications and because a single database or a single environment may not be accessible to all the applications that need the predictions in question, especially when some of those applications are cloud-based.

Figure 15 shows how these solutions are viewed by respondents. A little more widespread today than cloud-based analytic modeling solutions they are also somewhat more likely to be deployed in the future. Survey respondents were less concerned, rightly, with security when it came to this use cases. Interest often seemed to be driven by the wide range of systems into which analytics needed to be embedded.



Figure 15: View of cloud-based analytic deployment

Drivers for Adoption

Overview

Drivers for adoption were as you would expect with decreased cost, reduced time to value and increased agility all being widely seen as very or somewhat important by respondents. As Figure 16 shows, all three of these had around 90% of respondents citing them as very or somewhat important.

Figure 16: Drivers for Adoption



"Decreased cost should get two check marks!"

Survey Respondent

Curiously, given all the talk in the industry about recruitment and skills problems, a reduced need for skills didn't rate as highly as the other drivers among respondents. In fact, as Figure 16 shows, this driver is the only one that has decreased noticeably since 2011. Either the skills required for predictive analytics in the cloud don't seem all that different to respondents, reducing the value of cloud-based solutions in managing scarce skills, or the worry about a skills shortage is somewhat overblown.

One company uses predictive analytics in the cloud to help with its skills shortage. A predictive analytics in the cloud solution is deployed to give pre-built predictive analytics to analysts, most of who have little to no quantitative training. This gives a large group the opportunity to form their hypotheses, build models and draw conclusions. The lack of quantitative skills and experience in this group creates a risk that these conclusions could be erroneous so the data science team vets everything before it is deployed. The company benefits from some good ideas developed by this group and gains scale thanks to the decreased need for analytical skills. "For analytics teams who wish to minimize their overhead maintaining analytical systems, cloud-based systems are an attractive option."

Eric Siegel, Founder of Predictive Analytics World

It is also worth noting how overwhelmed many IT departments are. They simply cannot purchase, configure and spin up the hardware and software assets that the business needs. Moving to cloud solutions for these organizations may be a simple matter of necessity—they may not be able to wait for their internal IT teams even if they wanted to.





"Predictive analytics in the cloud allows us to manage our infrastructure more efficiently versus traditional physical deployments. We can quickly tune our infrastructure to meet rapid changes in volume and requirements, as well as create more comprehensive, effective recovery plans around our products and services."

Michael Zeoli, CTO, PNT Marketing Services, Inc.

Advantage Early Adopters

Just as we noted in 2011, those organizations that are already using some predictive analytics in the cloud are much more likely to deploy them in the future and to consider them important. This finding, and its consistency between the two studies is extremely significant. Early adopters of technology are often somewhat cynical about it due to the problems and challenges of being an early adopter. The Gartner Group even has a well known phrase—the trough of disillusionment—to describe what happens in the immediate aftermath of a burst of enthusiasm to adopt a new technology. This is **not** the case with predictive analytics in the cloud. For instance, Figure 18 shows that those organizations who report some deployment of predictive analytics in the cloud today are more likely to deploy all three use cases more widely in the future. In other words experience with any of the use cases makes all of them more likely to be part of future plans.

Figure 18: Impact of early adoption on future plans



Similarly Figure 19 shows that the same early adopters are more likely to consider all thee use cases as very important—very valuable in other words.

Figure 19: Impact of early adoption on view of importance



Those with predictive analytics in the cloud deployed were also more likely to use Big Data—see Big Data below.

Decision Management

Tightly integrating predictive analytics into operations, using Decision Management for example, has a significant difference to the effectiveness of predictive analytics in an organization. Respondents were asked how they typically deployed predictive analytics:

- Predictive analytics are occasionally used for decision-making
- Predictive analytics are regularly used for decision-making
- Predictive analytics are a primary driver for decision-making

Predictive analytics are tightly integrated into day to day operations

Those reporting a transformative impact were much more likely to also report that they tightly integrated predictive analytics into operations. Those with significant impact were highly likely to have either tightly integrated predictive analytics or use predictive analytics as a primary driver for decisions.

"Embedding predictive analytics in operational applications is a must-do activity irrespective of where this activity is performed."

Survey Respondent

What this means is that the more tightly respondents integrate predictive analytics into operations the more likely they are to report transformative impact from those predictive analytics. This is shown in Figure 20. While we would expect those tightly integrating predictive analytics to get better results than those only using it occasionally, the difference between those using it as a primary driver for decisions or regularly using it in decisions and those tightly integrating it is very noticeable. Clearly integration into day to day operations, Decision Management, makes a significant difference to results even when compared to regular usage of predictive analytics in decision-making.



Figure 20: Different integration approach and their impact

This result also mirrors our results in 2011, reinforcing the value of tightly integrating predictive analytics and of focusing on operational decisions to get value from predictive analytics.

It should be noted that this need not imply automation of the decision that uses the predictive analytics. While embedding predictive analytic models into automated decisions, perhaps using business rules, is a very effective operational deployment technique it is not the only one. Well defined manual decision-making approaches can be supported in operational systems. Predictive analytics can be effectively integrated into this decision-making by driving recommendations rather than final

decisions. Many organizations find this more palatable and evolve gradually towards increased automation.

As noted above the amount of impact from predictive analytics has increased since 2011 and this is paralleled by a significant increase in the rates at which respondents report operational integration and regular use over 2011. As Figure 21 shows, more respondents report regular operational usage with a matching decrease in those only using predictive analytics occasionally.



Figure 21: More integrated usage change over time

Obstacles

When asked about obstacles to the deployment of Predictive Analytics in the Cloud, respondents are very focused on rules and regulations. As Figure 22 shows, the top two obstacles or concerns are data security/privacy and regulatory/compliance issues. This is unsurprising as predictive analytics requires a lot of data and, for customer analytics, this means customer data. Ensuring this data is secured and that privacy rules are followed is critical. Moving this data to the cloud, or analyzing it there, requires that respondents deal with this issue.

"Cloud-based solutions mean either storing or transmitting our proprietary data to the cloud. Although there are safe ways to do this our management is not convinced."

Survey Respondent

Concerns about regulation and compliance show the greatest increase from 2011. Data security and latency/responsiveness are also up from 2011 with only complexity concerns showing a significant drop. Interestingly, however, there was a big increase in the numbers stating that latency/responsiveness was very important with increases otherwise coming only in the somewhat important category.

Data security/privacy Regulatory/Compliance Moving On-Premise Complexity Latency/Responsiveness

Figure 22: Importance of Inhibitors and Obstacles

"We operate under HIPAA/HI-TECH so data security and compliance each get 2 stars!"

Very important Somewhat important Not very important Not important

Survey Respondent

The flexibility of cloud-based solutions can sometimes cause problems in this area. Experienced modeling teams know not to expose personally identifiable information. The flexibility and ease-of-use of cloud-based solutions mean a greater number of less experienced users become involved. This growth may make it more difficult to enforce these kinds of rules leading to increased risk.

Big Data

The big topic in analytics recently has been the move to "Big Data." This is generally said to revolve around 3 Vs introduced by the Gartner Group—Volume, Velocity, Variety—though many other Vs have subsequently been added.

Cloud-based solutions have a number of core benefits in the Big Data space.

- First and foremost a significant percentage of the new data sources being lumped under the Big Data heading are only available in the cloud.
- Second the scalability of the cloud allows larger volumes of data to be effectively handled and consumed in modeling processes.
- By making it easy to access, integrate and work with new datasets, cloud-based solutions also allow for more rapid and widespread experimentation.

In a very real-sense Big Data and the cloud are joined at the hip and their adoption in predictive analytics is very likely therefore to move in parallel.

"Big Data Gravity attracts Predictive Analytics to the Cloud, where Big Data increasingly resides"

Gregory Piatetsky-Shapiro, KDnuggets Editor

As far as predictive analytics are concerned there is no sign that the volume of data being analyzed has changed in recent years. For instance, the Rexer Analytic Survey shows that typical predictive analytic datasets are about the same size as in 2007. As a result the survey focused on the impact of changes in variety and velocity: what new data types are being included in predictive analytics (variety) and how fast is the data being used in predictive analytics moving (velocity).

Variety

What's clear is that for all the focus on the new kinds of data sources, traditional data sources still dominate predictive analytics. As Figure 23 shows, structured data repeats as the most important data for building predictive analytic models. Just as in 2011, structured data is by far the most likely to be very important to respondents as they build predictive analytic models.

Third party data, consortium data for instance or other bought data, ranks second with unstructured data showing a clear lead over other big data types. Unstructured data from on-premise systems, such as call center or collector notes for instance, is on the rise. Those rating it very or somewhat important rose by 10% between 2011 and 2013 while its importance rose another 24% in future plans.

Respondents were asked about future plans for all these different data types. Every data type besides structured data and third party data was reported as likely to be

more important in the future than it was at present. This was reflected in comments also, with far more talking about what they hoped or planned to do than what they were doing today.



Figure 23: Overall importance of data types

Very important Somewhat important Not very important Not important

"Big Data is a misnomer as data has always been big. The challenge is making use of semi-structured and unstructured data in solutions. This will be the next giant leap forward in using data."

Survey Respondent

An analysis of the trends around data from cloud systems might lead one to be cynical about this, however. While future potential is seen for data from an organization's own cloud-based systems, its actual importance dropped between 2011 and 2013. This might lead one to conclude that while respondents believe what they are being told about the future potential of non-structured data their actual behavior is to continue to focus on the structured data that has worked well for them in the past. This too matches with results from the Rexer survey in which 64% of respondents report that their company either has no big data plan or is only at the very early stages of exploring big data.

"Voice, video, and other non-textual/tabular/numerical data is growing in importance."

Survey Respondent

However, when those who have seen a transformative impact from predictive analytics are compared to those who have yet to see any impact, or when those who already have cloud-based solutions deployed are compared to those who don't, there is a significant increase in the importance of Big Data types. These increases are shown in Figure 24. For instance social media and image data are nearly twice as likely to be important to those who have deployed cloud-based solutions while sensor data and voice data show big increases in importance among those that have already seen a positive impact from predictive analytics. Across the whole range of non-structured data types there are significant increases in the perceived importance of these data types to predictive analytics among those with more experience and better results.

"For more than 50 years, we have lived in a small data world, seeking the data set with the highest predictive value. That made sense when we were constrained by the volume of data that we could store and manipulate. Now those constraints are gone. The three V's of Big Data—volume, variety, and velocity—raise the stakes for analytics players to take advantage of the emerging big data infrastructure and help our clients get more value from data and make ever better decisions."

William Lansing, CEO, FICO



Figure 24: Impact of experience on Big Data Usage

There is a clear correlation here with more experienced respondents being much more likely to highly rate more unusual data types as important. Whether the use of these data types leads to more impact or more demand for cloud-based solutions or whether it is simply a reflection of more experienced organizations gradually moving beyond traditional data is hard to tell from these results. A little bit of both seems most likely with additional data sources driving better results, pushing organizations to the cloud and requiring a little more experience to use.

When it came to the scenarios in which survey respondents expected to see Big Data have an impact there was a very wide range. Examples included customer management, clinical decision support, fraud detection, customer satisfaction, aftermarket parts sales, competitive analysis from social media, appraisal, reinsurance, smart meters, fund market forecasting, web activity analysis and much more. Figure 25 and Figure 26 give more detail on the current and future importance of various data types to respondents.

Figure 25: Current importance of data types



Figure 26: Future importance of data types



Velocity

Near real-time is the right time as far as respondents are concerned. As Figure 27 shows, near real-time and overnight batch data are the most important when it comes to effectively using predictive analytic models.

Figure 27: Importance of different data velocities



Very important Somewhat important Not very important Not important

Static and batch data are clearly very important to predictive analytics but the trend towards real-time scoring, calculating predictions with up to the minute data, is reflected in the high scores for both near real-time operational data and real-time conversation data.



Figure 28:

Survey Respondent

Interestingly Figure 28 shows that the importance of static data and of near real-time data is up dramatically from 2011. Batch data is essentially flat while real-time data has dropped back a little.

Static data Near Real-Time Data Batch Data

Change in importance

While data from operational systems, and current data at that not a snapshot from yesterday,



is important in making accurate predictions it is clear that the predictive analytics market has not yet moved to streaming or really real-time execution of predictive analytic models. This direction to more real-time scoring, however, is set to continue and the use of predictive analytics in streaming scenarios is likely to grow in the future.

Plans

It is clear from the study that organizations are already adopting predictive analytics in the cloud and have broad plans to further adopt predictive analytics in the cloud solutions in the future. There are clear benefits to early adoption (see Advantage Early Adopters above). There is broad adoption across all three use cases (see Broad Adoption of All Three Use Cases above). It is clear that the time for organizations to adopt Predictive Analytics in the cloud is now.

All three use cases are delivering value so organizations can pick the approach that will work best for them. This could means adopting pre-packaged clod-based solutions that embed predictive analytics, building models in the cloud or using the cloud to make existing models more pervasive. All three use cases work so organizations can mix and match to find the combination that works for them.

"Going forward, I think the cloud decision is becoming irrelevant—premise-based advanced computing doesn't have much of a future for purely economic reasons. All of the counter arguments about security and control have been largely addressed."

Neil Raden, CEO & Principal Analyst: Hired Brains Research LLC

Regardless of which approach is taken there is a clear and compelling case for focusing on customers. A long history means that risk and fraud analytics play a big role in many organizations. It is clear from the study, however, that customers and customer analytics are increasingly the focus of predictive analytics. With strong solutions of every type available, organizations can apply the right use case to improving their long term customer relationships, improving engagement and driving more profitable relationships.

New to Predictive Analytics

While pre-packaged cloud-based solutions have a strong use case for all organizations they are particularly powerful for those new to predictive analytics. They are easy to adopt and offer the fastest time to value. Organizations can adopt them with fewer skilled resources and often find them easy to integrate.

These packaged solutions often focus on customers and this is where organizations should start. Organizations can find solutions that will help with customer management or satisfaction as well as with customer acquisition and development.

As organizations new to predictive analytics adopt these solutions they should remember that customers increasingly live in real-time. This means that analytic solutions around customer satisfaction will also need to be real-time, using up to the minute data in their predictions. It is also worth working with trusted vendors when it comes to customer analytics. This will ensure that there is expertise on hand to handle the privacy and security concerns that come with focusing on customer data.

Expanding Predictive Analytics

For organizations with more experience in predictive analytics the cloud offers an opportunity to industrialize their analytic processes. Individual pre-packaged solutions may be useful but the broad based adoption of the cloud to scale up existing analytic processes probably has more to offer. Cloud-based approaches can offer much more pervasive deployment of predictive analytics, allowing analytics to be pushed out to every system across the extended enterprise. As more analytic models must be built, monitored and updated, the cloud also helps analytic teams deliver predictive analytics at scale.

For these companies the focus should be on embedding predictive analytics deeply throughout their operational systems. Using near real-time operational data in these models for real-time scoring will make those models more powerful and accurate. Integrating predictive analytics deeply into operational systems will ensure that they deliver maximum value. Cloud-based approaches offer the deployment agility and ease of integration that will be required.

While there is justifiable cynicism about Big Data, organizations getting value from predictive analytics should be looking at new data sources. In particular they should be immediately focusing on how to enhance existing analytic approaches with unstructured data such as notes, emails and comments. The potential value of more complex types such as weblog, sensor, audio and image data should not be underestimated. While not for the faint of heart these data types are clearly correlated with increased impact.

The following pages include information from the study's sponsors FICO, Lityx and SAP.







FICO° Decision Management Platform



Build Predictive Analytic Solutions in the Cloud

Today's consumers demand fast, relevant and personalized interactions—and expect businesses to anticipate their needs.

Likewise, businesses continually need to define, test and deploy strategies to meet ever-changing goals and objectives. The challenge is in rationalizing the volume, variety and velocity of data to turn insights into actions that matter, while accounting for regulatory, economic and business strategy shifts.

FICO® Decision Management Platform helps you easily and cost effectively evaluate, deploy and scale cloud-based and on-premise analytic solutions for real-time decision management. It accelerates your ability to infuse precision and speed into your decision making processes and customer interactions.



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LityxIQ

Lityx

Lityx is an analytics firm that delivers solutions, consulting, and training to clients across a diverse set of industries. Lityx' flagship product is LityxIQ, an integrated cloud-based platform for implementing advanced analytics. LityxIQ ties together solutions for data management, customer analysis and insights, predictive modeling, and marketing optimization into a single platform.

LityxIQ's four core solutions are

- Data Manager import, clean, and manage multiple complex data sources
- InsightIQ develop customer insights and display in galleries or dashboards
- PredictlQ automatically build and implement complex predictive analytics
- OptimizelQ design and solve a wide variety marketing optimization scenarios

At its core, LityxIQ empowers business users to make effective use of advanced analytics. For example, with PredictIQ's simple business language interface, users can define and deploy models based on business needs such as predicting churn or customer value, instead of algorithmic and technical decisions. Models are scored against new datasets with a few clicks, or put into full scale production by setting them up to automatically generate new scores as raw data is refreshed.

Similarly, OptimizelQ translates user-entered business metrics, objectives, and constraints into mathematical language. Users need only know their data and requirements, not the underlying









math or coding. That makes it easy to deliver programs that optimize marketing dimensions such as channels, offers, customer contacts, or online advertising in very short time, and without a technical background.

While the LityxlQ platform is geared toward empowering the business user, power users such as statisticians and model developers can be much more efficient and leverage their skills more effectively. Instead of focusing on coding and manual iteration, advanced users can pay more attention to model design and comparison, and translating business requirements into technical settings. For example, PredictlQ supports multiple algorithms of interest to the technical user, such as regression, CHAID and CART-style trees, nets, SVM, Naïve Bayes, Random Forest, and ARIMA. Bake-offs with automated comparisons across multiple algorithms and settings can be setup with a few clicks.

In the end, the ultimate objective of an analytics program is to deliver value to the business.

LityxIQ has been used by organizations with results like the following examples:

- 90% cost and time savings to build series of two-dozen models, with 5-10% more accurate results compared to using other tools.
- Reduce prediction error of customer value models by 50%, leading to greatly improved offer assignment and optimizing customer response.
- Over 90% lift in response rate and similar decrease in cost-per-order in a cross-channel optimization series of models.

LityxIQ can also transform enterprise analytics through its support of big data and its secure, cloud-based, hosted environment. Business users can easily tap into rich data sources without internal IT resources, pass them through LityxIQ, and create models in hours or days instead of waiting out months-long internal implementations. And because it is a flexible platform, users are not restricted to customer or marketing analytics problems. LityxIQ can solve a variety of business challenges including risk, fraud, disease prediction, supply chain and forecasting, and much more.





Predictive Modeling and Marketing Optimization in the Cloud

www.lityx.com 888-LITYXIQ info@lityx.com Twitter: @LityxIQ



Transform Your Future with Better Business Insight Using Predictive Analytics

Get ready for a new approach to predictive analytics

An integrated set of analytics solutions from SAP has been designed from the ground up to enable you to fully exploit the new reality – from database to decision. Our solutions enable you to combine the power of predictive processing using the SAP* HANA platform with intuitive modeling and advanced data visualization provided by SAP Predictive Analysis software.

Vast datasets are mined in the database using the numerous native algorithms and R integration available in SAP HANA and SAP Predictive Analysis. With predictive insights embedded and extended into focused business applications and business intelligence content – including delivery via dashboards, alerts, and mobile devices – analytics goes beyond serving professional data scientists to supporting line-of-business users.

With SAP solutions, you can unlock the potential of big data by providing access to massive amounts of both structured and unstructured data and by enabling complex questions to be answered with blazing speed. In addition, you can take advantage of deep integration with Hadoop for preprocessing and built-in text analysis.

A full range of predictive analytics functionality is at your fingertips – whenever you need to mine vast amounts of structured or unstructured data.



Optimize future outcomes with predictive analytics

Organizations can no longer focus solely on delivering the best product or service. To succeed, they must uncover hidden customer, employee, vendor, and partner trends and insights; anticipate behavior and then take proactive action; and empower the team with intelligent next steps to exceed customer expectations. They also need to create new offers that increase market share and profitability, develop and execute a customer-centric strategy, and target the right offers to the right customers through the best channels and at the most opportune time.

Predictive analytics with SAP solutions allows you to achieve real-time insights that increase understanding of customer behavior, improve your response to customers, and deliver tangible business value – ultimately driving your profitability. SAP customers are already reaping the rewards gained by reducing time to transform information into insights and by improving the quality of decision making based on those insights to drive higher profitability and growth. Why not join them?

Summary

You can put predictive analytics into the hands of business users as well as data analysts and statisticians with an integrated set of SAP* solutions powered by the SAP HANA* platform. Unlock the potential of big data by providing access to massive amounts of both structured and unstructured data and by enabling employees to answer complex questions with blazing speed.

Objectives

- Take advantage of new market forces that are changing the landscape and creating new opportunities
- Unlock the value of big data volumes from structured and unstructured sources
- Reduce the time and cost of data processing by improving technology performance with in-memory processing

Solution

- Big-data analytics using in-database processing and integration with "R"
- Intuitive modeling and advanced data visualization
- Availability of predictive analytics to everyone in the business

Benefits

- Understand how historical sales, costs, and other key metrics translate to future performance
- Compare predicted results with goals
- Reveal the causes of customer satisfaction and employee turnover
- Show how past and emerging trends impact the bottom line
- Find correlations in data for cross-sell and up-sell opportunities
- Locate anomalies and clusters for targeted analysis

"With this [SAP HANA, R, and Hadoop], we have found a way to shorten the genome analysis time from several days down to only 20 minutes." Yukihisa Kato, CTO and Director, MITSUI KNOWLEDGE INDUSTRY

Learn more

To find out more, call your SAP representative today or visit us online at <u>www.sap.com</u>.



C With InfiniteInsight[®], we can deliver the right offer, to the right customer at the right time.**??**

 Dr. Jacky Huyghebaert, Customer & Market Intelligence Expert Belgacom

The Shape of Your Social Network

KXEN's InfiniteInsight[®] Social Network Analysis provides a unique spectrum of social network analysis capabilities so that you can understand social influence and behaviors across customer communities.

What's more, because InfiniteInsight[®] Social Network Analysis is 100% native to InfiniteInsight[®], you can integrate social attributes (e.g. influencer scores) into all of your predictive modeling to optimize campaigns across the customer lifecycle – whether it's member-get-member, crosssell, up-sell, retention – you name it.



We Revolutionized Predictive Modeling

With InfiniteInsight[®], you can build predictive models to gain unprecedented insight into your customers – from acquisition through cross-sell, up-sell, churn prevention, and generally taking the next best action with every interaction, across every customer channel.

For us, it's not about building great algorithms in a lab environment. It's about making predictive analytics usable, accessible and productive in real operational environments. It's about solving real business problems.

Analytical Data Sets With Clicks, Not Code

With InfiniteInsight[®] Explorer, power users define a broad set of reusable business components, called analytical records, which can be applied over and over again to automatically create the analytical data sets used for predictive modeling.

This innovative approach is orders of magnitude faster and results in far less human error than traditional handcrafted techniques.

Accurate Models. In Days, Not Months

KXEN's patented InfiniteInsight[®] Modeler automates the building of sophisticated predictive models for every data mining function under the sun.

We'll help you quickly get to the right algorithm for your business problem with a model built for accuracy and optimal results. And arm you with business and executive summary reports so you can discuss the drivers behind your models across your team.

Put Scores Into Action

With clicks, not code, InfiniteInsight[®] Scorer can deploy optimized scoring equations directly in-database.

And because predictive scores often feed into complex business rules and decisioning engines, InfiniteInsight[®] Scorer's open interfaces support integration to enterprise applications like your call center or website through Java and PMML, or legacy environments like SAS natively and SPSS.

Every Model at Peak Performance

With traditional predictive methods, it's impossible to optimize great numbers of campaigns, become overly granular in targeting, or to retrain models on a regular basis. It's simply takes too long and competes with other business priorities.

InfiniteInsight[®] Factory has shown that there is no reason to be satisfied with an out-of-date model. In clicks, business users can schedule model refreshes as often as needed by the business.

Deep Domain Expertise and Solutions

It's our mission at KXEN to help our customers get real business value from their investments in predictive analytics. For us, it's about going deep within an industry. To deliver solutions designed for you to compete on analytics. And guess what? It's worked for over 400 of our customers worldwide.

- :: Communications: we're helping over 40 of the leading communications providers optimize relationships for over 300 million subscribers globally including Vodafone, Cox, Belgacom, U.S. Cellular, and Rogers
- Financial Services: over 45 of the largest banks and insurance companies worldwide have standardized on InfiniteInsight[®], including Bank of America, Wells Fargo, ING, Discover and Barclays, to manage over 200 million of their own retail and commercial relationships
- Retail: leading retailers like Lowe's, Sears, True Value, Eldorado, Allegro, Darty, Shutterfly, Overstock.com and MonotaRO – are using InfiniteInsight[®] to manage customer relationships that contribute over \$500 billion in annual revenues.





Regression Scoring (Likelihood to Purchase)





Demographics

Of the more than 350 respondents who took the survey approximately 240 completed the demographic profile. Financial Services, Health Care, Manufacturing, Insurance, Retail and Hardware/Software were roughly 75% of the industries represented with the remainder spread across a variety of industries as shown in Figure 29. 24% were service providers (not shown).





Larger companies were well represented with over 40% of respondents coming from companies with 2,000 or more employees (Figure 30). Business, IT and analytic professionals were all well represented (Figure 31).



About the Study

Predictive Analytics in the Cloud: Opportunities, Trends and the Impact of Big Data 2013 was a multi-client, multi-stage study.

An online survey was widely promoted through Sourcemedia's Information Management and the analytics news site KDnuggets as well as through the mailing lists of Decision Management Solutions and of the study's sponsors. In additional a survey panel was used. Across these different approaches more than 350 survey responses were received.

Experts and users of predictive analytics in the cloud were interviewed to gather additional context and commentary about the role of cloud in the adoption and development of predictive analytics. We would like to acknowledge the assistance of Neil Raden, Louis Columbo, Gregory Piatetsky, Jim Ericson, Karl Rexer, Andrea Scarso and Eric Siegel.

We would also like to acknowledge our research sponsors without whom this research would not have been possible—FICO, Lityx and SAP.



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