Data Analytics and the Talent Gap

Across Industries the Shortage of Talent Calls for New Thinking

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Data analytics is how information, once gathered, sorted and processed, is utilized for maximum optimization in terms of insights. It’s the knowledge behind the questions: What will people think, buy and desire? Are there ways to improve our business? How can fraud and risk be reduced?

In 2012, nearly 72 percent of businesses in the United States increased spending on analytics. The volume of data gathered, and the need for analysis and talented people to conduct it, is immense and growing daily. At the same time, trends are developing and adherents can find a solution seemingly designed and customized to the needs and interests of their own particular industry, service or product line.

The Harvard Business Journal states that while the 21st century’s sexiest job may be data scientist, such employees are a “hybrid of data hacker, analyst, communicator and trusted advisor,” and notes this is indeed a rare combination of skill sets. A general consensus is that there is a critical talent shortage in the realm of data analytics, and there are a number of explanations for this shortage.

This paper summarizes why data analytics are important to companies and how they are being used. It provides an overview of offerings from various analytics providers and how companies work with them. Most importantly, it identifies challenges from a talent and leadership standpoint and includes recommendations for addressing them.

Industries seek to make use of data in ways which are most effective for them. Healthcare insurers (eg. United Health Group and WellPoint) pharmacy benefit managers (eg. CVS and Express Scripts) and healthcare providers (eg. Health Management Associates) use data analytics to suggest treatment plans, predict compliance and reduce readmissions.

More than 70 percent of banking executives worldwide say customer centricity is important to them. Financial institutions are expanding their use of data analytics in key areas, such as customer retention, increasing share of wallet and reducing risk.

Manufacturing, which generates a third of all data today, is using it to align cost structures with customer value measure, predicting what customers will value in the future and determining the likelihood of leading performers leaving one employer for another.

A number of trends in data analytics are recognized as noteworthy. Several consultants have named data visualization, mobile data, Big Data clouds and predictive analytics as those that will have the most impact in 2014. Other trends include machine learning, discovery platforms, mobile data and the creation of the chief analytics officer position.
To summarize these trends briefly:

**Data visualization** makes data analytics accessible, interactive, and engaging. Generally accepted benefits of visualization are that it enables faster observation and retention of trends and patterns. However, the overuse of visualization can make the complex deceptively simple, and the inverse is true as well.

**Machine learning** is just that - computers learn from data as it is input and updated, with predictive and prescriptive models increasing in accuracy over time. It can increase the productivity of quantitative analysis but the leading environments still require people to specify variables, adjust model parameters and interpret the content for decision makers.

**Discovery platforms** were once used primarily in the science industries, but increasingly involve data management and analytics, making data manipulation more economical and easier to use. Adaptation has been slow, but developing and exploiting platforms will become a priority.

**Mobile data** is growing fast and companies need to think strategically about how to engage with customers on their mobile devices. Mobile data will be considered a top priority, with a need for specialization in defining mobile metrics, understanding mobile technology, and collecting and analyzing mobile data.

**Big Data Clouds** can now leverage platforms such as Amazon Web Services and operate with greatly lowered capital costs. Big Data analytics solutions that require a pay-as-you-go data storage model and computing-intensive analysis infrastructure allow businesses to lower the costs of infrastructure design, setup and management, and will continue to gain ground in 2014.

**Predictive analytics** enable companies to develop insights and foresights based on collected data. The increasing demand for data to be used in decision making means that predictive analytics will continue to grow in 2014. IBM, SAS and SAP are recognized by Forrester Wave as particularly strong leaders in predictive analytics solutions.

**Chief Analytics Officers (CAO)** can help companies maximize resources and many organizations, such as FICO, Facebook and AIG, have created such positions. Such a strong advocate and overseer of analytical and Big Data resources makes sense for an organization serious about analytics. Just as the role of chief data officer exists within larger organizations, the role of chief analytics officer may be a logical addition to the C-suite.
Advisory firms like Deloitte, Ernst & Young, Navigant and others have expertise in operational and risk management, and deep industry domain knowledge. They are building analytic tools to support their operational consulting and risk management practices. Deloitte has gathered data to create lightweight, challenge- and industry-focused analytics. Their work in oil and gas analytics has enabled accurate forecasting, reduced costs and increased profitability. E&Y’s “single thread” approach links performance drivers to performance outputs, using driver analytics to mathematically link outcome metrics with market, competitor, operational and financial forces. Navigant’s Legal Technology Solutions Group provides innovative solutions for complex data management challenges with primary areas of focus in data profiling/validation, remediation, mapping and quality strategy, as well as financial transaction review.

Industry-specific data providers such as Nielsen, IRI (Retail and Consumer) and IMS Health gather large volumes of data from multiple sources, then process and report on this information on behalf of their clients. These companies are merging their structured data with social data, utilizing advanced analytics to provide advanced insights. IRI’s Retail Market Watch™ is a quarterly digest of key trends impacting the CPG retail industry, focusing on emerging consumer behaviors, key growth categories and changing retail channel dynamics. IMS gathers information from a vast network of suppliers, including 45+ billion annual healthcare transactions, and hosts it on the IMS One Intelligent Cloud for industries such as healthcare and financial services.

Software vendors IBM, SAP and Oracle have acquired a number of business intelligence and analytics companies. These acquisitions provide the platforms and tools for data management, business intelligence and reporting, and are now expanding their capabilities for Big Data analytics. According to Forrester, SAS and IBM are strong leaders in these areas, with SAP a notable newcomer. IBM's Smarter Planet campaign and acquisitions of SPSS, Netezza and Vivisimo, demonstrate its commitment to predictive analytics. Oracle Business Analytics solutions help organizations strategize and optimize business operations to capture new market opportunities on any device.

Global technology services companies like Accenture, Cognizant, Capgemini and Wipro have built large business intelligence practices and are now adding analytics capabilities to the suite of services they offer to their clients. They are primarily service providers who partner with technology vendors to build analytic platforms for specific industry processes. They are also capable of outsourcing the bulk of a client’s data management, reporting and analytic capabilities.

Accenture offers cross-industry analytics in customer and marketing, fraud and risk, human capital, sales, customer service, as well as industry specific analytics in all major industries it serves. Wipro leverages its own unique approach to “KPI” to deliver business analytics and performance management to an equally wide range of businesses and industries, including aerospace, transportation, utilities, automotive and government.
Traditional process outsourcing companies like Genpact, ADP and FICO manage transactions, data and processes on behalf of their clients in the areas of financial administration, credit and collections, human resources and payroll. They are expanding their analytic capabilities to provide additional insights in order to help their clients improve their operations and reduce risk. The industries they serve range from financial services and healthcare to manufacturing and technology.

Boutique analytics services companies like Mu Sigma, Opera Solutions and Fractal have emerged to provide analytics consulting and outsourcing service capabilities to their clients with a deep scientific foundation. Mu Sigma’s interdisciplinary approach to decision sciences applies math and technology to solve constantly shifting and ill-defined business problems. Opera Solutions employs machine learning to drive insight, execute predictive models and provide real-time access with minimal investment in IT and infrastructure.

The use of business analytics brings enormous benefits to companies, but when it comes to analytics talent, there is a critical mismatch between supply and demand. There’s a shortage of professionals skilled in using statistics, quantitative analysis and information-modeling techniques to make business decisions. As the use of analytics becomes more and more pervasive, companies are looking for a variety of analytics talent to help them drive a broader range of business applications.

The U.S. labor market has historically had a high level of graduates with degrees in STEM (science, technology, engineering and math) fields. However, the supply of such graduates has decreased significantly at a time when demand for them has been rising. According to a recent study conducted by Accenture, between 2010 and 2015, employers in industries such as banking, insurance, pharmaceuticals, oil and gas, and business analytics will add approximately 117,600 analytics jobs across seven countries. The chart below details these findings:

**New analytics jobs by industry**

Analytics services and pharmaceuticals lead the pack in the highest percent of analytics jobs being created in developing nations. However, in more mature economies, insurance and banking will add the most analytics jobs.

Distribution of new analytics jobs in each country studied, 2010-2015

<table>
<thead>
<tr>
<th>Industry</th>
<th>United States</th>
<th>India</th>
<th>China</th>
<th>United Kingdom</th>
<th>Brazil</th>
<th>Japan</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytics services</td>
<td>11%</td>
<td>54%</td>
<td>25%</td>
<td>9%</td>
<td>14%</td>
<td>6%</td>
<td>9%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>14%</td>
<td>24%</td>
<td>32%</td>
<td>19%</td>
<td>30%</td>
<td>44%</td>
<td>26%</td>
</tr>
<tr>
<td>Insurance</td>
<td>39%</td>
<td>7%</td>
<td>8%</td>
<td>32%</td>
<td>11%</td>
<td>27%</td>
<td>24%</td>
</tr>
<tr>
<td>Banking</td>
<td>20%</td>
<td>11%</td>
<td>22%</td>
<td>25%</td>
<td>19%</td>
<td>14%</td>
<td>25%</td>
</tr>
<tr>
<td>Oil and gas</td>
<td>14%</td>
<td>3%</td>
<td>10%</td>
<td>13%</td>
<td>23%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Communications</td>
<td>2%</td>
<td>1%</td>
<td>3%</td>
<td>2%</td>
<td>3%</td>
<td>1%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td><strong>Total number of jobs</strong></td>
<td><strong>38,700</strong></td>
<td><strong>31,500</strong></td>
<td><strong>30,500</strong></td>
<td><strong>7,000</strong></td>
<td><strong>6,200</strong></td>
<td><strong>2,400</strong></td>
</tr>
</tbody>
</table>

Note: Highlighted cells represent industries with the highest percentage of new analytics jobs in each country.
Source: Accenture Institute for High Performance analytics
Accenture estimates that only about 10 of every 100 qualified graduates accept jobs specifically identified as analytics roles, while the other 90 tend to pursue positions such as investment bankers, software developers and consultants. Sometimes the choice comes down to personal preference, but Accenture found that too often the choice reflects a lack of awareness concerning employment opportunities in analytics.

A qualified data analyst should have the requisite skills to move into analytics, perhaps receiving training on the job. IT professionals are beginning to be aware that the Big Data sector is increasing in importance, and they are asking themselves “How do I obtain these skills?”

A number of universities are adding programs in analytics and data science, which will broaden the mix of analytics-related pedigrees available. A great candidate is part statistician, predictive analyst, business analyst and trusted advisor. In addition to possessing a deep understanding of math and statistics, these individuals need to understand business, have the ability to analyze social and other unstructured data, and know how to design and test predictive models.

In essence, data analysts are telling stories using data. Developing deep analytical skills requires not only an intrinsic aptitude in math, but also years of training. While remedying the talent shortage will not happen overnight, the search for deep analytical talent has already begun.

Companies with more fully developed marketing analytic capabilities have significantly higher rates of return on their marketing investment than those without such capabilities. The market for talent is tight, but there are a number of tactics employers can use to address this shortage, including:

- **An “always on” approach to hiring and recruiting**

  The traditional model of placing a job posting on the company website as a position becomes available is waning. An “always on” culture should be created and fostered in which recruiting is treated as an ongoing process, with talent tapped as it becomes available. Social media has proven to be crucial in the development of a pipeline of talent. Conscientious maintenance of one’s online presence keeps both organizations and talent updated and relevant.

- **Partnerships with external firms**

  Relationships with trusted recruiting partners who can help facilitate matches between “buyers” and “sellers” should be cultivated. Moreover, there are intermediaries that certify analytic talent, both formally and informally, by providing formal credentials, such as the Institute for Operations Research and the Management Sciences (INFORMS). Online social networks for analytics professionals, such as AnalyticBridge, which makes explicit or implicit endorsements of the educational background and experience of analytics talent, are an obvious source through which to contact potential new hires.
Company Acquisitions

Hiring at startups is robust and millions of dollars are being invested in identifying high-value use cases, building analytical models to predict the future, and creating subscription services to ingest data and extract insights that can then be monetized and/or sold. Startups also attract particularly dynamic and innovative talent. According to McKinsey, “This will likely all shake out over the next several years, with market forces and employees themselves driving the outcomes. Third-party solutions will cover many of the most valuable use cases—and internal teams will be relegated to more mundane work, if not cast adrift.”

Utilization of a mixed team approach

Organizations recognize that the perfect, “everything-included” candidate may not exist, or even be necessary. A team comprised of statisticians and marketers who mine, analyze and develop campaigns around the data can resolve issues creatively and effectively. It’s quite possible that the role of data scientist as currently defined requires more attributes than most individuals should be expected to possess. Some companies are resolving the gap by creating teams comprised of diverse skill sets. They’re mixing and matching professionals so as to deliver a balanced response to business analytics questions and creating high-performing teams that can deliver tremendous business value.

Internal development and training

Existing managers can be trained to develop and better utilize their analytic skills. Understanding the basics enables them to ask relevant questions about the quality of statistics and the incorporation of new data types.

The real value of data analytics cannot be realized without a dynamic leader at the executive level who is charged with delivering value, as well as engaging and motivating the company as a whole to appreciate that value. A CAO is integral to an organization’s survival by furthering an organization’s business interests and effectively minimizing its risk. But these executives need to be able to speak business as well as they do IT, to act as shuttle diplomats between the analytics experts and line-of-business executives. They are not just comfortable working with data but also with other members of the leadership team. Not surprisingly, finding these kinds of bilingual leaders is no easy task.

Based on senior executive searches in this field the following qualifications are most desirable:

- Master’s degree (Ph.D. preferred) in computer science, business analytics, applied mathematics, statistics, engineering, economics, social sciences or related fields.
- 15+ years of experience in information technology. Proven track record of working with big data, social data as well as cloud based delivery of solutions.
- Solid grounding in applied mathematics and statistics, including expertise in applying these techniques to structured and unstructured data.
Awareness of business objectives and ability to apply this understanding to recommend and implement product development for difficult and complex technical issues.

Ability to share information across business functions and disciplines; manage stakeholders with diverse interests; make actionable recommendations.

Excellent analytical, communication, organizational and presentation skills.

Develop solutions which focus on how to successfully extract insight from “Big Data.”

Strong, results-driven personality with a high level of enthusiasm, energy and confidence.

**Conclusion**

Companies are facing a large supply gap at all levels of data analytics talent. Entry-level positions are challenging to fill, as are those at the most senior levels. The solution to this issue is not offshoring, as there aren’t enough qualified individuals in emerging economies such as India, China or Brazil. Hiring and retaining the best analytics leaders will require different strategies for different companies. The company that does this right will have a substantial edge over its competition.
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