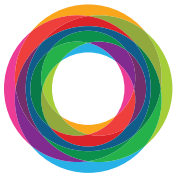


# 3 Mission Critical Applications of Big Data in Oil & Gas

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## 3 Mission Critical Applications of Big Data in Oil & Gas

Major players in the Oil and Gas industry, particularly Oil Fields Services companies, understand that big data analytics can provide valuable insights that will help make exploration, production, manufacturing, and global operations more streamline, safe, and efficient. Leaders in the industry are already implementing big data solutions into their everyday operations and reaping the rewards of this long-term investment.

As more and more Oil Field Services companies are committing to investing in big data analytics, they're recruiting experts – Chief Data Architects, Data Scientists, Data Engineers, etc. – to spearhead these efforts in their organizations. But how can OFS leaders be sure that these big data experts are leading them down the right path and aligning their data analytics goals with overall business objectives?

If OFS executives want to ensure that their big data investments will yield a positive ROI and help them make smarter, faster, and more informed decisions, they must select big data pioneers who will prioritize the following critical missions:

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### About Our Firm

Founded in 1963, Battalia Winston is one of the world's largest woman-owned executive search firms and is consistently ranked as one of the top fifteen executive search firms by Kennedy Publications. The Firm is headquartered in New York City with offices in Boston, MA; Chicago, IL; Edison, NJ; Los Angeles, CA; and Washington, DC. Over the past 50 years we have conducted executive search assignments and established expertise in virtually every major industry and functional area. Clients range from early stage companies to Fortune 10 global enterprises.

## ***Using Big Data to Improve and Inform HSE Compliance***

Health, safety, and environmental concerns continue to be the most pressing challenges in Oil and Gas, so it's no surprise that OFS companies are rapidly adapting big data solutions to improve the safety and decrease the environmental impact of their operations.

Consider hydraulic fracking, the culprit behind HSE concerns like air pollution, contaminated drinking water, and earthquakes. By aggregating and analyzing data from increasingly sophisticated subterranean sensors, drillers are learning more about how they can reduce the amount of fracking fluid they inject in the earth's strata. Along the same lines, OFS companies are using big data solutions for enhanced mapping of reservoir characterization and more accurate prediction of potential reservoirs' precise locations, enabling them to make better decisions about where to drill and minimizing the total amount of exploratory wellheads.

Using Big Data for HSE management not only has the potential to improve safety and decrease environmental impact, but will also naturally lead to a more effective and less expensive operation.

## ***Improving Talent Recruitment, Retention, and Training with Big Data***

Major players across the Oil and Gas sector are struggling to recruit talented employees at all levels of the organization. Aging baby boomers leaving the Energy industry workforce, the delayed effects of the Oil & Gas industry's hiring freeze of the 1980's, and an increase in demand for the entire spectrum of oil field services products have all contributed to a talent pool characterized by talent clusters at either end of the spectrum: potentially talented but inexperienced on one end, very experienced but ready to retire on the other.



John Ebeling, Partner

John Ebeling joined Battalia Winston in 1999 and leads their Oil & Gas practice. John has over 25 years of North American and international retained executive search, executive assessment, and management consulting experience. He conducts significant search assignments for clients in Europe, the Middle East, Russia and Africa. Recent search assignments within the Oil and Gas industry have been concentrated in Houston, Texas, EMEA, Canada (Alberta and Ontario), and in South America.

After having completed search assignments for Fortune 500 clients including the General Electric Company, General Mills, Mobil Oil, AT&T and Coca-Cola, he is filling officer level positions worldwide. He has devoted much of the past ten years to building a management team for a \$1.5 billion client, with operations in North America, Europe, Japan and Asia.

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While many OFS companies are using big data to improve drilling operations, a few pioneers are using talent analytics internally to overcome this recruiting challenge: measuring employee engagement, identifying skill gaps, and modifying their recruitment practices as necessary. They're also using big data to improve employee productivity and determine where to invest in training and professional development. Because a single Oil and Gas company may have employees dispersed all over the world, big data offers the ability to integrate siloed data to see trends (Who are the best employees? Why is their performance so impressive? How can that be emulated elsewhere?). These efforts may also improve employee retention, as A Society of Petroleum Engineers Survey, found that 53% of oil and gas workers would consider leaving an employer if training wasn't provided.

Big data leaders should also consider partnering with academic institutions to develop a pipeline of talented recruits for both traditional engineering roles and data science roles. NYU, for example, has developed a graduate program within its Center for Data Science that trains students in math/statistics, computer science, and data science, helping them establish a flexible foundation that can translate across industries. Chief Data officers building teams around big data initiatives will need to understand how to best recruit talented data scientists and, once they're on board, how to pair them with employees with more industry expertise in order to create a team that can effectively tackle industry-specific challenges.

### ***Protecting (and Leveraging) Data Assets***

Data security is typically one of the first concerns when big data becomes a dominant tool in an industry. Since big data initiatives in the oil and gas industry aren't relying on any sensitive personal information -- personal



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Walter joined Battalia Winston in 2013 through the acquisition of Norm Sanders Associates where he spent over 25 years as a Managing Director and Founder.

Walter has extensive experience in recruiting Practice Leaders and Partners for world class consulting firms as well as recruiting senior level systems and technology professionals for clients in the Financial Services sector including banks, investment banks, institutional asset managers, mutual funds, and insurance companies. Specific clients include: Goldman Sachs, Merrill Lynch, Morgan Stanley, Deloitte Consulting, IBM Global Services and Ernst & Young.

Prior to joining Norm Sanders Associates, Walter was a VP with Handy Associates. He entered the executive search industry with KPMG where he developed a financial services industry recruitment function.

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identities or financial information, healthcare-related information, etc. – privacy and security is not major issue in that sense. However, security is still paramount because the data that is collected from the field and from the distribution channels is a valuable asset, one that domestic and international competitors could benefit from greatly if they were able to access it.

Big data pioneers in Oil and Gas need to establish stringent security policies from the get-go to deter hackers and minimize the risk of security breaches. They need to ensure that the physical assets (like sensors) are just as secure as digital assets.

But leaders must also creatively assess how their data assets can be leveraged to generate additional insights. First, data scientists should think about how they could use data from other players in the industry – distributors, equipment manufacturers, software developers, etc. – to inform their operations, and vice-versa. Developing a mutually beneficial (and secure) data sharing program could give both partners a competitive edge.

Finally, the most effective big data leaders in Oil and Gas will be able to think beyond the possibilities of existing data. They'll need to tackle a new challenge that we're calling "Applications Conceptualization" – envisioning what could be done if the right data was available. This forethought requires a keen understanding of the business's objectives, the economic landscape, and a thorough understanding of what data is available and how it can be collected.

One thing is clear: OGS executives hoping to use big data solutions to improve and streamline global operations need to be looking for a dynamic, forward-thinking leader who knows how to prioritize the endless number of potential big data applications. It's important



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Managing Director

Roy Lowrance is Managing Director of New York University's Center for Data Science, part of the university-wide Initiative in Data Science and Statistics.

In addition to his Managing Director appointment, Lowrance continues to be a Senior Research Scientist in Computer Science at NYU's Courant Institute of Mathematical Sciences, and is currently a doctoral student in machine learning, also in the Computer Science Department of NYU. He is a founder of Advanced Valuation Analytics Corporation, where he develops real estate valuation and mortgage default prediction models.

Prior to joining NYU, Lowrance was CTO at Reuters and Capital One Financial. He was also a management consultant at McKinsey and Company and a partner at the Boston Consulting Group.

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that the leader in charge of these projects avoids some of the mistakes we're seeing in other industries: over-investing in a particular big data solution at the expense of others, failing to apply any gained insights or make any changes to the business, or failing to build a business intelligence team with an optimal mix of technical skills, industry knowledge, and business acumen. The appropriate combination of upfront big data investments and long-term application strategy could propel any company ahead of their competitors.



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## *NYU's Center for Data Science*

The NYU Center for Data Science is a focal point for NYU's university-wide initiative in data science and statistics. The Center was established to help advance NYU's goal of creating the country's leading data science training and research facilities, and arming researchers and professionals with tools to harness the power of big data.

The Center's faculty members and scientists are established experts in the field of data science. Their interests are primarily in mathematical statistics, computational statistics and machine learning, optimization and large-scale computation, system design for large-scale data science, and several application areas, such as artificial intelligence, computational biology, computational economics, or quantitative methods in social science. As it grows, the Center will attract new scientists and graduate students whose primary research and teaching activities revolve around data science.

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