

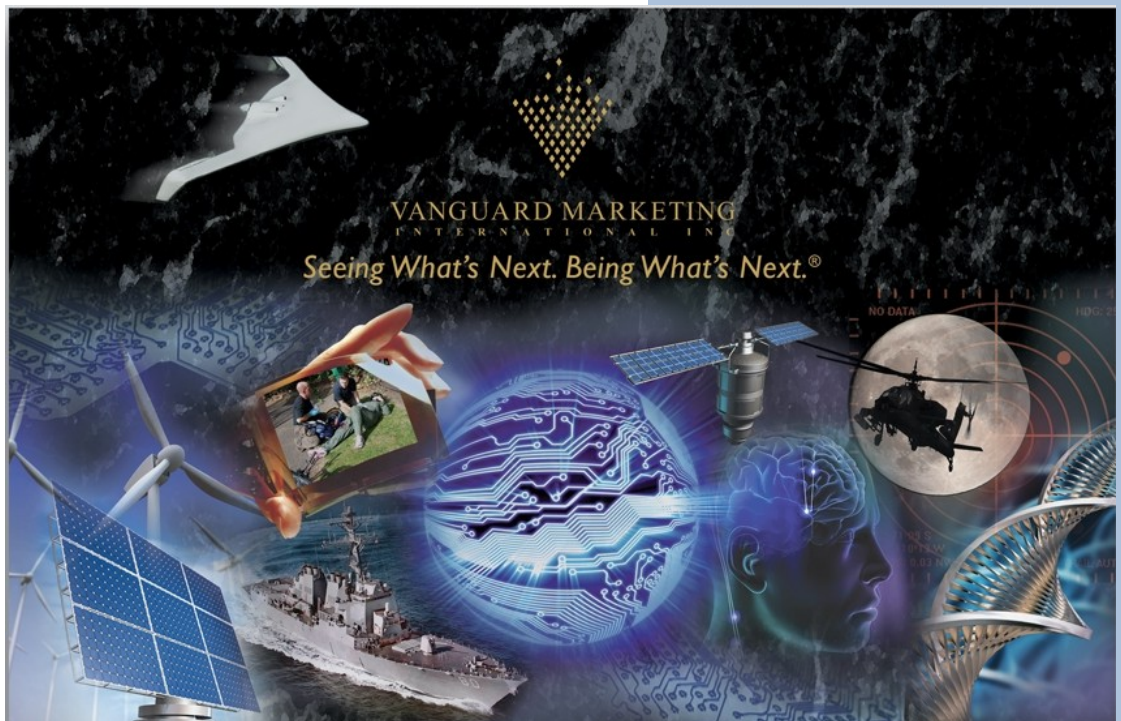


# Key Findings

## Advanced, Predictive Analytics

### *Breaking the Barriers to Adoption*

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# Advanced, Predictive Analytics

## *Breaking the Barriers to Adoption*

### About the Research

VMI returns once again to big data and the discovery process utilizing analytics technology to not only understand what has happened but what might happen and what should be done next in order to improve business performance and mitigate risk. Over the last couple of months, our team researched and interviewed subject matter experts in the Big Data Analytics Market, many of whom are either pioneering research at universities, delivering the tools and services to early adopters in commercial, civilian and defense markets, or implementing the capability within their own enterprise. These thought leaders volunteered to join VMI's "Topical Community" and provided us with cross industry-level insights and perspectives. We thank them for their contributions to the body of knowledge and to this key findings briefing.

### Introduction

Advanced and Predictive Analytics (APA) is not a new science or technology. As a statistical, modeling, machine learning, and data mining solution, it consists of algorithms and techniques used to gather and analyze both structured and unstructured data in order to predict outcomes of the problems' solutions. It has been used on structured data for decades. What is new however, is the application of APA on big data, where 80% of the data is unstructured, comprising streaming video, images, signals, logs, email, blogs, twitter, other social media feeds, and so forth.

Many enterprises faced with implementing advanced analytics for the first time, are caught short in expertise able to prepare the data in order to deliver value. Upwards of 60-80% of new implementations fail. Yet the promise of predictions which will enable substantial business performance gains and risk mitigation is what drives awareness, experimentation and adoption.

United Parcel Service (UPS), a pioneer in realtime *prescriptive* analytics — data-driven integration and application of business intelligence and predictive analytics used to optimize resource allocation within the enterprise, is realizing mammoth cost savings. During UPS' prototype rollout phase (2011-2012), they saved 3 million gallons of fuel that



translated to a reduction of 30,000 metric tons of CO<sub>2</sub> emissions. Fully deployed this year, UPS expects optimization through predictive analytics will save them \$300-400 million a year. The realtime aspect cannot be underscored. From pilot phase to full deployment, predictive-recommendation times (instructing drivers, as an example, best route given traffic, weather, customer preferences, etc.) went from hours, to minutes, and now seconds.

#### Examples of Business Performance and Risk Mitigation - Predictive Analytics -

##### Marketing Analytics:

Predicting consumer behavior, churn analysis, consumption analysis, propensity to spend

##### Business Analytics:

Economic forecasting, business improvements, risk analysis, financial modeling

##### Industry Specific Analytics:

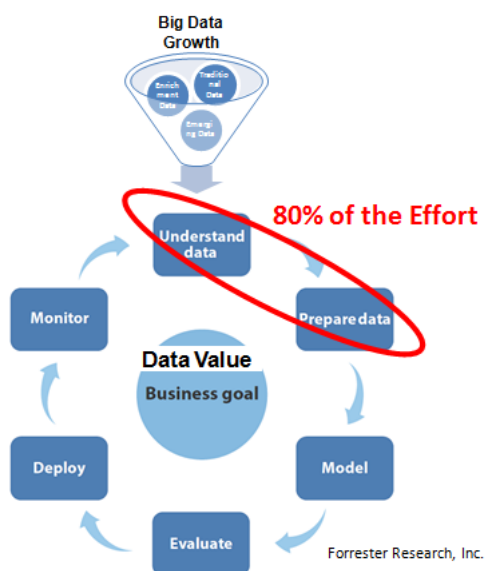
- Reliability assessment (i.e. predicting failure in machines)
- Analytics situational awareness, behavior (defense)
- Investment analysis, fraud identification (insurance, finance)
- Predicting disabilities from claims (insurance)
- Finding patterns in health related data (medical)

## Gap between Big Data Growth and Data Value

Only 50% of data is being analyzed for insights today. The vast majority of data, which is unstructured and machine generated, contribute heavily to enterprises' nightmare

surrounding data deluge. In the defense world, one hour of streaming Intelligence, Surveillance and Reconnaissance (ISR) video feeds requires as much as 10 or more hours of human viewing, assessment and tagging in preparation for machine-based, analytical processing. Commercial enterprises similarly say 80% of the ingest effort in advanced analytics is in preparing the data which includes merging, filtering, cleaning and shaping data from their source systems in preparation for doing analytics. The level of effort can be huge and poses a significant barrier to APA adoption.

A further challenge in closing the gap between big data and deriving data value is that the full predictive analytics process — from ingest to modeling to outcomes, requires data scientists, data miners and/or statisticians rather than business or intel analysts who know the line of business or mission and can best detect, discover and apply insights to solve business





problems. The skill level between disciplines can be extraordinary and divergent. Furthermore, data scientists are in short supply, and can command salaries of upwards of six-to-seven figures; While business and intel analysts can require years of hands on experience and topical knowledge.

Lastly, describing potential APA value alone does not make it. Predictive analytics must enable better decisions and measurable outcomes, via integration within the enterprise systems and processes in order to achieve optimization of resources. According to UPS, the greatest challenge is *changing behavior*—where business managers buy into the resource allocations or utilization schedules created by predictive/prescriptive analytics systems. Change management is needed in order to achieve full alignment between the meaning of data and the business operations to orchestrate the data driven promise.

## 2015 Trends That Will Break the Barriers to APA Adoption

Going forward, 2015 looks to be the year for breaking barriers to APA Adoption.

***Everyone will be an analyst*** utilizing analytics of some kind. As with the introduction of consumer smart phones that drove adoption of mobile devices within the enterprise, the level of analytics available to consumers in wearable technologies like smart glasses, smart watches and fitness bands will drive enterprise and industrial adoption to new levels of business performance and risk mitigation, but much more quickly. Data hobbyists are cropping up everywhere, blogging about best data sets for solving problems. Individual entrepreneurs to medium sized businesses are gaining competitive advantages quickly over their larger siblings by filling the market needs with credible discoveries and insights they can quickly communicate with off the shelf APA tools.



Easy Jet Maintenance Engineer using Epson's BT-200 Smart Glasses and predictive analytics driven Augmented Reality for troubleshooting repair.

***Data blending remains to be the most sought after and valuable capability for analysts (12-24+ months).*** Data blending and data discovery will finally take the noise out of Big Data and help remove legacy IT silos by reducing their complexity via drag and drop tools which enable greater insights, faster. Whole new classes of enriched data will also emerge, as new unsupervised machine learning algorithms create human meaning from unstructured big data that will spawn a new class of users.

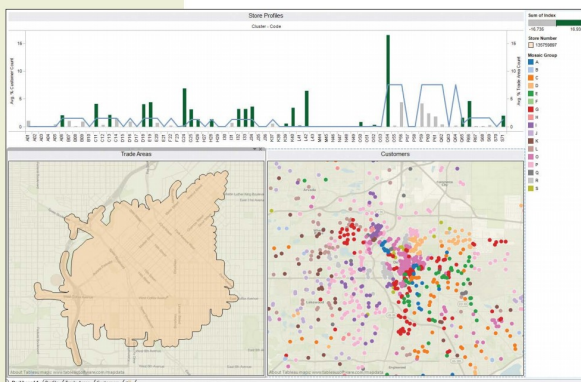
***Predictive modeling that relies on coding will be a minority sport.*** Why? Productivity and the need to focus on solving business problems, enabling business analysts to work

*Note: These trends were introduced to VMI primarily by Alteryx and further substantiated by other Topical Community Members*



immediately on complex challenges without having to learn deep coding languages or wait for ITs' often over-committed resources. New business tools and libraries of drag and drop capability will enable faster prototyping and exploration of big data to help the analysts discover insights more quickly.

Using Alteryx to combine customer, geo-spatial, and Mosaic data, you can then create rich data visualizations in Tableau to help you better target prospective customers



***As visualization gets smarter with advanced analytics, so do storytelling and insights.*** As predictive analytics continues to greatly enhance understanding and comprehension, for the business analysts, enterprises will understand that it's not just about the answer - but knowledge augmentation that will drive new business paradigms.

***The biggest source of innovation will come from the Line-of-Business Analysts,*** not Specialists (Scientist, Data-Miners). The most successful operations that our Topical Community have seen are organizations that

start seed funding and empowering small cross-functional, data-oriented teams, charging them with delivering tangible and measurable benefits in relatively short, but meaningful periods of time. Their objective is about growing team predictive analytics experience as organic centers of excellence, which will drive confidence for a new culture of innovation throughout the enterprise. Fostering smaller successful experiences that are valuable and really fast will change the mindset and internal dialog between all business lines — from sales, customer support to maintenance engineering.

***As APA experience grows and the better a business unit or division gets at understanding their own business, the faster they change their future.***

***As Advanced and Predictive Analytics experience grows and the better a business unit or division gets at understanding their own business, the faster they change their future.***

## Solutions that will Drive Adoption

Industry is attacking the source problems of most implementation failures because of the opportunities which will drive new, sustainable revenue for them for years to come. In a recent study funded by Huawei, Big Data Analytics Market between 2013 to 2018 will see a CAGR of 26%, from \$2 billion to nearly \$10 billion. The specific areas of growth include: Real-time analysis and decision making; Precise Marketing; Operation Efficiency; Innovative Business Models; and Customer Experience Enhancement.

Vendors such as SAP, Dell (Statsoft), IBM, SAS, Rapid Miner, TIBCO, Actuate, Revolution Analytics, Alteryx and others are educating the early market via webinars, free trials, and case studies on the promise of Advanced and Predictive Analytics, while helping groups within the enterprise deliver solutions.





But, in the forefront of industry, venture capitalists and foundations are financing university and industry labs in areas which will substantially improve data veracity, depth of understanding, and performance of APA, as seen in advancements in cognitive intelligence to Warehouse-Scale Computing (WSC). Google continues to push the envelope on unsupervised learning, where machines read, interpret, and relearn unstructured images in preparation for analytical processing. The Allen Institute for Artificial Intelligence (AI2) Foundation is awarding grants to universities to advance the interpretation and common sense meaning of symbols, diagrams and patterns, as children would in their early to mid development years.



Technological advancements to watch will be those that can reduce the time spent at the data ingest stage while ensuring accuracy, fidelity and/or truthfulness of the information. Eleven hours for one hour of video is a huge barrier. Through cognitive and neural image caption generation, a lot of the time consuming, repetitive effort and associated human errors can be eliminated. As the new era in data analysis advances several recent developments, including the rise of the WSC, the massive explosion in online data, the increasing diversity and time-sensitivity of queries, and the advent of crowdsourcing

are taking place. Addressing those needs, UC Berkeley's AMPLabs, partially funded by Amazon Web Services, Google and SAP, is ushering in big data Hadoop platform competitors such as Spark, Shark and other, order-of-magnitude high performance systems and tools.

Lastly, watch for the case studies and alliances of Professional Services companies expert in successful application and implementation of APA. Their stories and expertise enable us to envision the promise and build awareness by educating the enterprises on how to accelerate expertise and confidence to transform businesses while providing greater insight to management teams and investors through prescriptive analytics.

## Conclusions

Advanced and predictive analytics is a vast and quickly developing emerging market. Getting started is easy; finishing difficult. The amount of time and complexity to ingest and prepare data is huge – mostly, it lacks veracity (accuracy, fidelity and truthfulness). Complexity of algorithms and analyst skill levels limits the utility and accessibility to the enterprise. Getting hearts and minds around the APA promise is difficult when 60-80%



of new APA projects fail.

Those line of business analysts that are empowered to gain experience and fast-turn success with advanced and predictive analytics will be the seeds for Centers of Excellence – within the enterprise. They will drive adoption – through collaboration and instilling confidence in teams throughout the organization.

Advanced and predictive analytics will be at the heart of every enterprise needing to improve performance and mitigate risk, and will comprise the core engine of vendors' products or services offered. They know that if they don't lead their competitors will. The better they get at understanding their own business through APA, the faster they change their future.

## Acknowledgement

Again, we would like to thank our thought leaders (VMI's Topical Community), without whom this paper would not be possible. Their insights continue to deliver great value to our research and allow us to provide you with a cross industry perspective.

While this briefing has covered top findings, if you are interested in gaining further insights, we would be happy to arrange a teleconference to discuss them in further detail. Please give us a call at 480-488-5707.

The VMI Team

## About VMI

Founded in 1992, in Phoenix, Arizona, Vanguard Marketing International's longstanding mission is, "to be widely recognized for clear cutting edge thinking and delivery of actionable results that make a difference for our clients." VMI's methodologies and expertise gives us the ability to analyze markets and design processes that produce disruptive, innovative, low-risk strategies and action plans. VMI works on an ongoing basis with many of its clients to ensure that they address changing market needs, capitalize on important industry trends, and maintain brands, which clearly differentiate their company and innovations throughout the investment community and prospective markets.

As a follow-up, the reader is encouraged to review Vanguard Marketing's website and published white papers on selected topics related to VMI's core competencies at:

<http://www.e-vmi.com/html/papers.html>

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