



## Where's the Real Opportunity in Big Data?

By John Cronin

*[This white paper is based on a presentation Mr. Cronin gave at the Big Data Innovation Summit held January 28 & 29, 2016 in Las Vegas, Nevada. Formerly one of IBM's top inventors, Mr. Cronin is the founder and CEO of the innovation-on-demand company ipCreate.]*

Everybody's talking about Big Data.

But what is it, exactly? What does it mean for your business? And how do you innovate Big Data's amazing capabilities into new products and services that serve your customers and return maximum value for your company?

Simply put, Big Data is the technology-enabled ability to spot real-time trends — and comprehend relationships between seemingly-disparate events and actions — in order to predict outcomes that are critical to business success.

There is no such thing as a Big Data industry per se. That's because Big Data is *everyone's* business, just as the Internet back in the 1990s quickly became everyone's business.

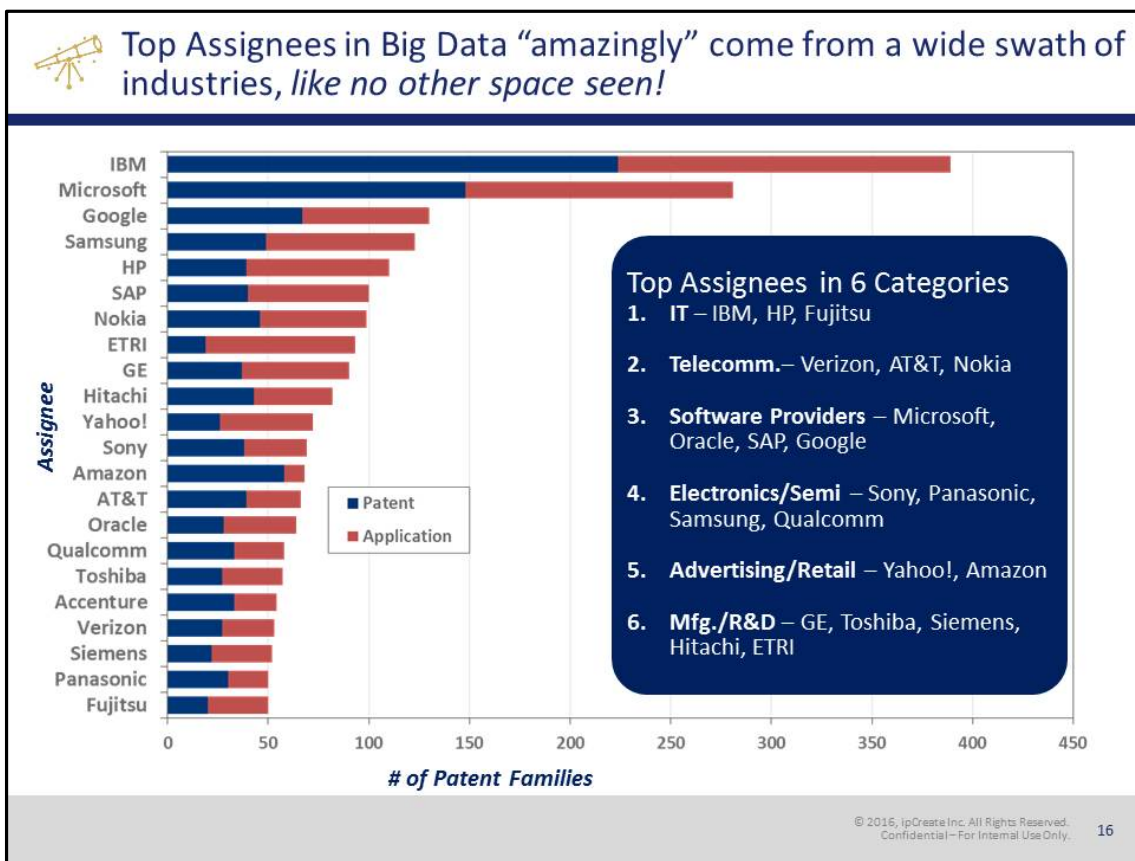
But the fact that Big Data is everyone's business means that you have to be extra smart about innovating and then owning the new Big Data products and services you develop for the marketplace. But be forewarned: you will face three big challenges in this effort.

### **Challenge No. 1: Spotting the Biggest Opportunities in Big Data**

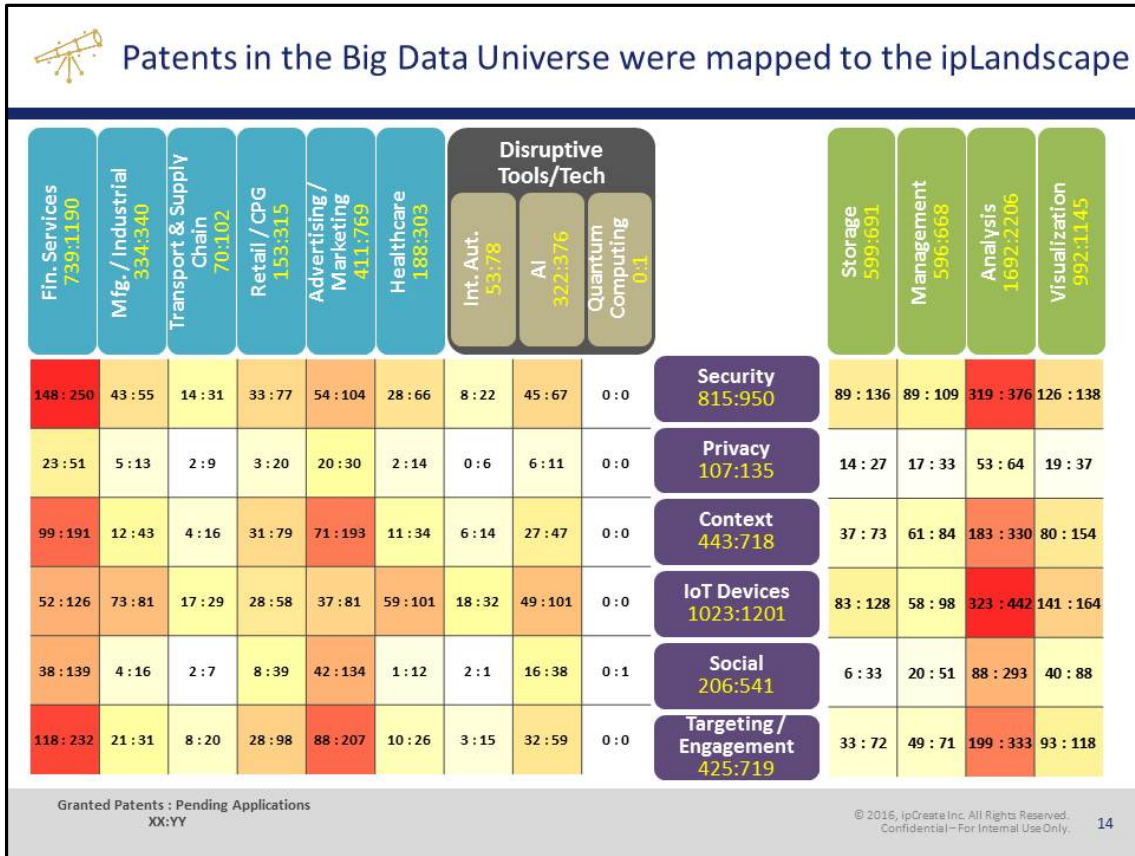
The first challenge is that a lot of big companies are already patenting heavily in Big Data. In fact, these large players have already amassed more than 17,000 patents grouped in 9,500 patent families covering Big Data applications. The total number of Big Data patents has doubled just since 2005 — a rather striking rate of growth.



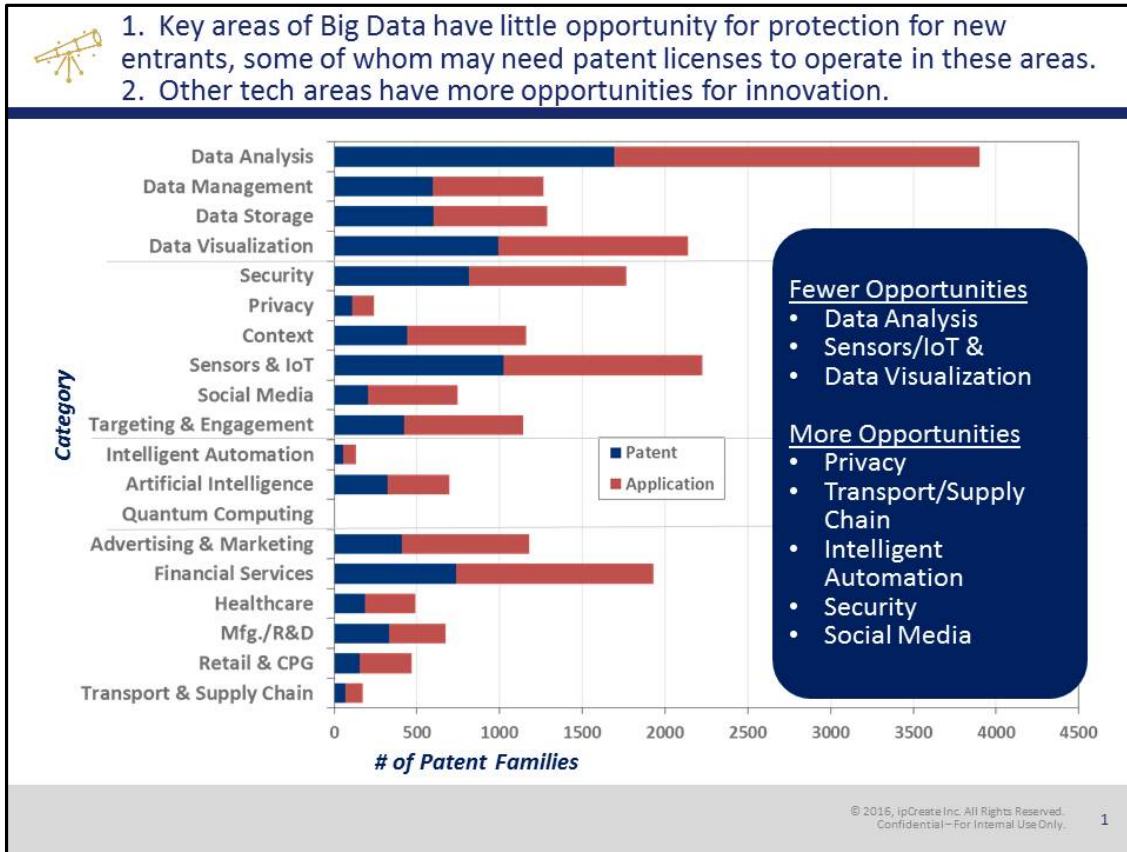
Just who is doing this patenting? As the chart below shows, the firms patenting most heavily in Big Data come from a strikingly-wide range of industries, proving once again that Big Data is everyone’s business. You can see a diverse range of large IT companies like IBM and HP; telecom firms like Verizon, AT&T and Nokia; software providers such as Microsoft and Google, electronics and semiconductor giants including Sony, Samsung, and Qualcomm; retailers like Amazon; and manufacturing firms such as GE, Siemens, and Hitachi. Even ETRI, which is a Korean government-sponsored R&D entity, is involved.



In what sectors are they patenting? As you can see in the next chart below, they are patenting most heavily in data analysis, data visualization, and sensors and IoT (Internet of Things) devices, leaving less opportunity for new entrants to innovate their own Big Data solutions in those sectors. New players may even need licenses to operate in these areas.



But that said, there are still plenty of “white space” opportunities for new entrants in Big Data innovation. Indeed, as the next chart below suggests, some of the biggest opportunities lie in privacy, transport and supply chain, intelligent automation, and even social media and security (although patenting in these last two sectors has started to increase of late).



## **Challenge No. 2: How to Innovate Big Data Products and Services**

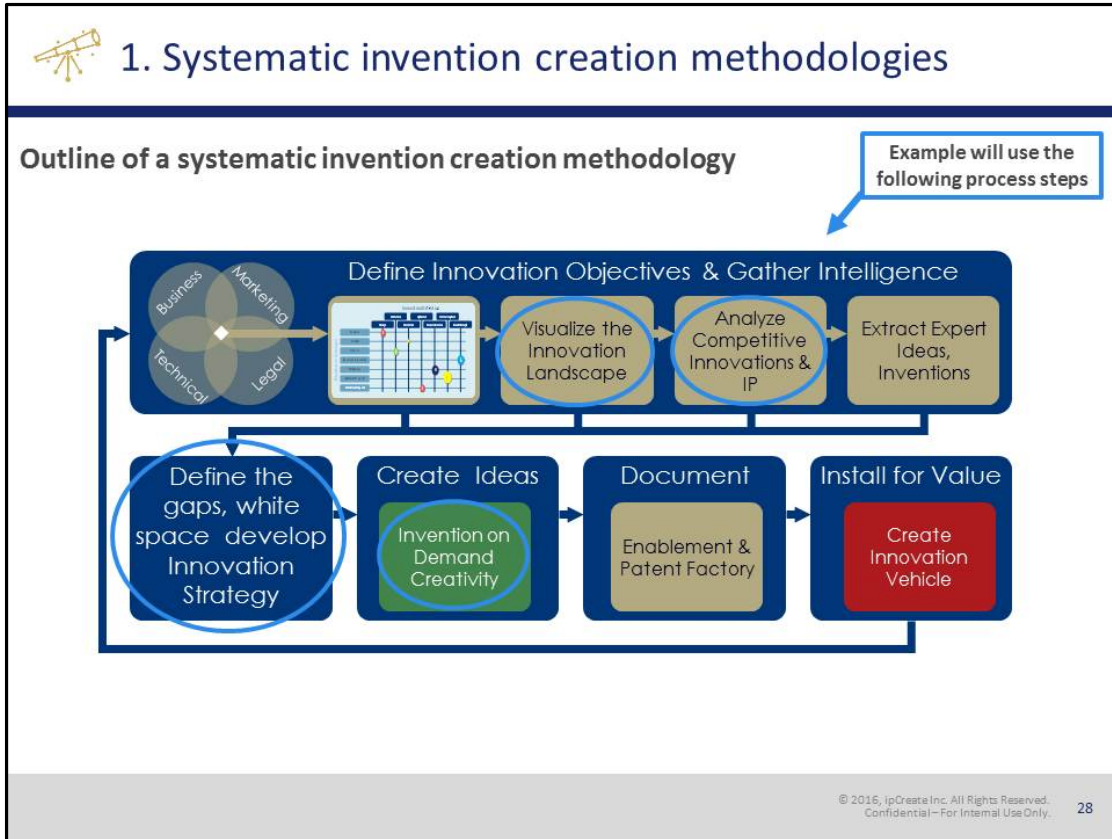
So how does a company innovate Big Data-enabled products and services in areas with the biggest white-space opportunities?

Given the huge expense and time-lag involved in traditional R&D, it would be nuts not to use the Internet itself and all its Big Data (and little data) capabilities to virtualize the innovation process itself.

What is “virtualized” innovation. It’s an organized systematic process that employs powerful creativity and invention tools to harnesses the entire power of the internet to rapidly and inexpensively innovate new products and services on demand.



The process looks something like this:





And it gives you capabilities like these:

**3. Using entire resources of the internet**

**Use the internet to find business, markets products, technologies, problems and solution components**

- Access to technical expertise
  - Translation services
  - Video conferencing
  - Advanced patent searching
  - Webcrawlers
  - Valuation
  - ...
- Access to research
  - Numerous Databases
  - Crowd to get thru paid databases
  - Specific white papers easy to investigate
  - YouTube
  - ....
- Crowdsourcing
  - Mechanical Turk
  - Data mining
  - Crowd Innovation
  - .....
- Social Media Interrelationships
  - Facebook
  - LinkedIn
  - .....
- Better links to customers
  - Product testing
  - Survey Monkeys
  - .....

Example will focus on patent database and data mining

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Indeed, you can employ SurveyMonkey to figure out what people want in a product or service — and how much they’ll pay for it. You can use Article One Partners’ 35,000 research experts worldwide to landscape the value of any market or market segment. You can use potent search tools to find subject matter experts, integrated knowledge databases translatable from any language, market-sizing tools of every kind, and white papers with analytics on every technical and market question imaginable. You can even employ Amazon’s Mechanical Turk to locate a crowdsourced, on-demand, and scalable workforce to build your new product or service.

What forms might such innovations take? This is where the creativity comes into play.



Imagine you're in the commercial security business. You design and sell products and services for retail chains like Walmart that attempt to limit employee theft and fraud, which is a huge problem costing U.S. businesses upwards of \$50 billion a year.

In this case, your Big Data opportunity could lie in designing algorithms that analyze data such as the real-time video feed from security cameras, real-time data capture from point-of-sale cash registers, and data on day-to-day employee time card check ins that allows analysis of heretofore-hidden correlations with seemingly-unconnected facts — such as the number of people in line, the number of transactions run, the average size of the transactions, the method of payment (cash, check or card), and the time of day (is it near closing time?).

A Big Data innovation here would be able to spotlight a hidden delta between receipts expected and receipts received that suggests employee theft may be occurring.

Take another example — this time from the privacy arena. Let's say you design and manage employee wellness programs for business. Three-quarters of U.S. employers now have such programs because the majority of full-time workers in the U.S. have one or more chronic conditions that raise their employers' health costs. And these health costs have now become the third largest expense for businesses. Since studies show that for every \$1 spent on employee wellness programs, medical costs fall by \$3.27 and absenteeism costs fall by \$2.73, encouraging better health habits among employees is a no-brainer for companies.

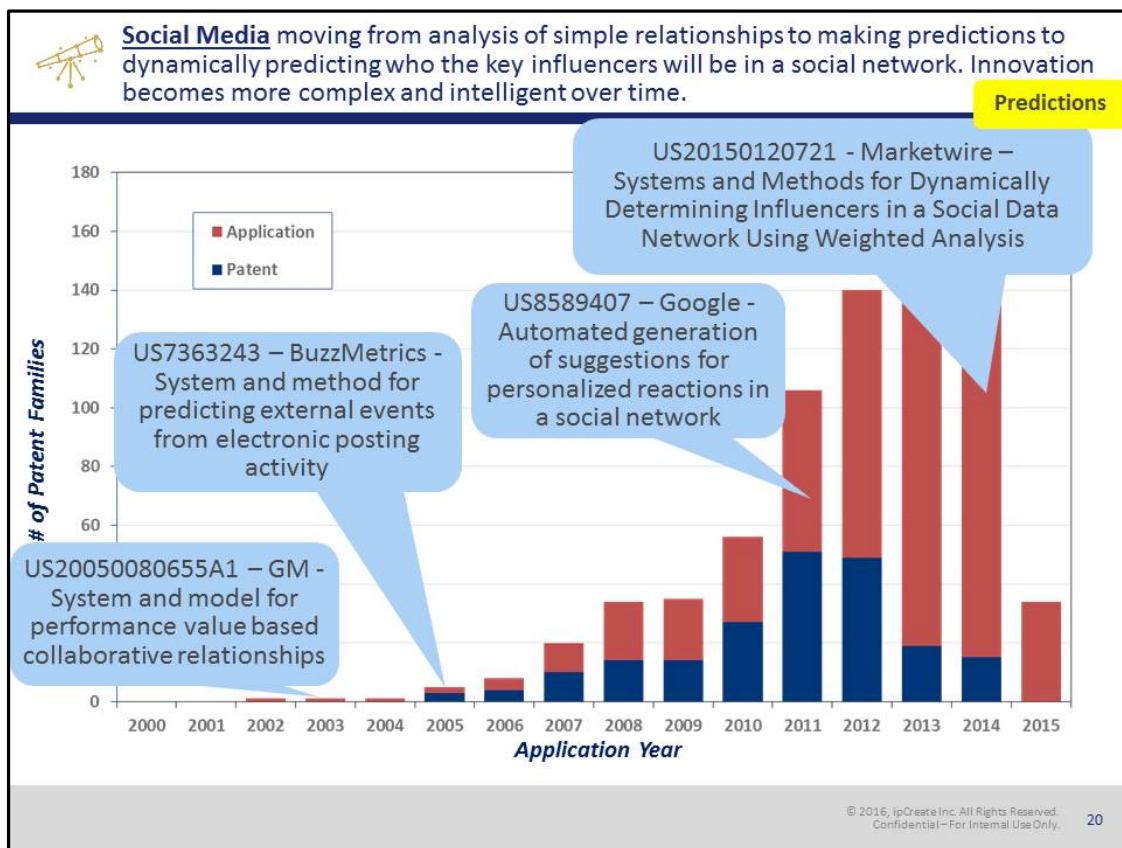
Your Big Data innovation here might be to design algorithms that can spot unhealthy workplace trends — a major spike in stress levels, for example, or a workplace-wide increase in the aggregate body-mass index of employees — by evaluating employee biometrics in real-time via wearable devices without compromising the absolute privacy and confidentiality of individual employees' health information.

Finally, let's take a real-world example of a Big Data innovation at work — this time from the social media field. A California startup called Banjo has designed complex algorithms that analyze social media — texts, photos, Instagram, Twitter feeds, etc.— to uncover real-time trends developing or events like fires or earthquakes before the media or even first responders know about them. Media outlets use



Banjo to find out what’s happening — fires, or political protests, or whatever — and brands like Starbucks use Banjo to find out who’s talking about them and what they’re saying.

In each of these white-space opportunity sectors, Big Data innovations have been getting more complex and multi-dimensional over the last decade, as the following chart illustrates. In social media, for example, early Big Data innovations initially focused on modeling performance in collaborative relationships. Then BuzzMetric developed a method for predicting some events based on social media postings. By 2011, Google had patented a system for automatically generating suggestions based upon personal reactions. And more recently, MarketWire invented a system and method for using weighted analysis of social data to dynamically determine the key influencers in a social network.







That's one of the great things about patents, by the way — you can study the history of innovation in any field just by reading the patents in order. And if you do it right, the effort can often spark new ideas of your own.

In any event, yes, there's still plenty of white-space opportunity for creative new entrants to capitalize on the Big Data revolution and innovate high margin new products and services. But then you come up against the third great challenge in Big Data innovation.

### **Challenge No. 3: How to Patent Your Big Data Innovations**

The truth is that unless you can patent those innovations and make them proprietary, your company won't be able to reap the full value of those innovations. Patents, after all, mean higher margins and market share —for high-value innovations like Big Data, an average of 50% higher, says a study from Carnegie Mellon University, Duke University, and Georgia Institute of Technology entitled [“R&D and the Patent Premium.”](#) So the risk of not being able to patent a breakthrough Big Data product or service is a very serious matter for new entrants to the field.

And to put it bluntly, ever since the U.S. Supreme Court in 2014's *Alice v. CLS Bank* decision limited the kinds of software and business methods that can be patented, it's gotten a lot harder to patent the software and services that drive today's powerful Big Data applications

No longer can you simply reproduce a normal human activity (say, analyzing data to spot heretofore-unseen correlations) through sophisticated computer algorithms and get a patent for it — at least not a patent that the courts are likely to enforce. To be patentable nowadays, software has to take a genuinely-inventive step and either trigger an action, employ a device, or in some other way produce a tangible transformative result.

In the commercial security example used above, for example, one approach that would be innovative and get past our Alice hurdle would be to design the software in that Big Data employee theft prevention system to trigger in real-time the analysis of all the data — including the stress levels of employees via facial recognition software — and then lock down any cash register flagged by the




algorithms while also alerting security. This invention would likely be patentable under *Alice*, so long as it was genuinely novel and non-obvious — and the patent application sufficiently detailed as to precisely how the action was triggered by the data.

In the employee wellness space, the answer might be to alert HR and managers of any increase in health risks spotted by your big Data innovation — or even simply to text employees.

As for the example of Banjo’s social media innovation, again, the patentable invention may be to have the Big Data algorithms trip fire alarms in a building, or broadcast a text alert to everyone in the immediate vicinity. In this way, Banjo could spin out dozens of new companies — a media news feed company, a brand monitoring company, an emergency services dispatcher, a political organizing tools and services company for election campaigns.

So how do you capture the premium that comes from patenting a proprietary innovation?

The first step is to cross-check your map of white-space opportunities in Big Data against the landscape of *Alice*-vulnerable patenting issues. You will want to avoid areas of highest risk for *Alice* issues and focus on lower-risk areas, like the privacy sector shown in the chart below.

 2. Use “Alice Proofing” techniques to find areas of low risk for Alice-based non-patentability: the Privacy field.

Alice Checklist											
ipLandscape® Categories	Challenge of just Internet	Computer Network enhancements only	Abstract Business Activity	Business Improvement via Internet?	Law of Nature, or just abstract idea	Human Activity	Longstanding Commercial Practice	Economic Practice / Math Relationship	Novelty Level and promoted art	Specific Examples	Overall Alice risk
Data Analysis	Low	High	Low	Low	Low	Low	Med	Med	Med	N/A	Med
Data Management	Low	High	Low	Low	Low	Low	Med	Med	Med	N/A	Med
Data Storage	Low	High	Low	Low	Low	Low	Med	Med	Med	N/A	Med
Data Visualization	Low	High	Low	Low	Low	Low	Med	Med	Med	N/A	Med
Security	Med	Med	Med	Med	Low	Med	Med	Med	Med	N/A	Med
<b>Privacy</b>	Low	Low	Med	Low	Low	Med	Low	Med	Low	N/A	Low
Context	Med	Med	Low	Low	Low	Low	Med	Med	Med	N/A	Med
Sensors & IoT	Med	Low	Low	Low	Low	Low	Low	Low	Med	N/A	Low
Social Media	High	Low	Med	High	Low	Med	High	Med	Med	N/A	Med
Targeting & Engagement	Med	Low	Med	High	Low	High	High	High	Med	N/A	High

High = difficult to overcome Alice issue during inventing and documenting  
 Med = challenging to overcome Alice issue during inventing and documenting  
 Low = Not considered an issue for Alice when inventing and documenting

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The Big Data opportunity is real — as real as the Internet opportunity was when the first commercial web browsers appeared in 1993. But you need to be smart about seizing it.

You need to analyze the entire market, technology, and product landscape, looking for the best white space opportunities for innovation. Then you have to filter those opportunities to find those most open to patent protection, remembering that any patents you file must be able to surmount the newly-tightened *Alice* standards for software patentability. And then you’ve got to get your virtualized innovation process and teams moving to rapidly innovate and patent Big Data products and services that solve real customer problems.

The winners will be those companies that move quickly and innovate smartly.