



SITEK Inc. INSIGHT – Big Data and Technology

Date: March 1, 2018

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As with each SITEK INSIGHT, it is our objective to provide interesting reading and pertinent topics that are informative, relevant and provide actionable INSIGHT. The purpose of the March 2018 SITEK INSIGHT is to discuss Big Data, not from an algorithm, or algorithmic way but more from an analysis perspective and how to best manage Big Data and Technology. Many business professionals view Big Data in a commercial way. This is fine because business people have one mission and that is to improve metrics in market share/penetration, profits, conquest sales, ROI, customer retention and the list can go on and on. That is not to say that only business people utilize Big Data. For example, engineers can now employ Big Data capabilities to make the best and safest products; this also transcends to probably every vocation and job title that we can think of. Just for the sake of this INSIGHT, we will be speaking from purely a business or enterprise perspective.

As previously mentioned, lots of business professionals view Big Data in a commercial way as a method to define a problem or bring about a solution. In short, large datasets are involved in the computation of creating solutions that will yield better performance or problem-solving capabilities. Keep in mind that the term big data can also include terms such as scalability and efficiency.

The question that needs to be asked is what really defines the use of Big Data and solving a problem? Does this mean that the computation involved needs to have a predetermined set or defined purpose? This would include terms such as data mining, information retrieval or simply an algorithm that would form a graph to identify a problem(s) in general could be labeled as “Big Data” implying that a large or big dataset was used? These are obviously big thoughts that one can begin to ponder.

Let’s get down to earth and look at some big data business trends. Recently I was reading an article from a study on big data, one report stated, *“Despite widespread optimism regarding Big Data’s potential, only 23.5% of enterprises have a clear strategy”* (Source, Forbes)

This in and of itself could have a great impact on a business or enterprise who are trying to develop and employ big data strategies. So, what are new trends in employing big data in forming concrete strategies? Obviously, big data trends will include what we all love to discuss, and that is technology. By the way the report also stated, *“76% of all organizations are planning to increase or maintain their investment in big data over the next two to three years.”*

Think of Big Data and technology allowing for Anytime/Any Contact, Any Place/Any Thing, Any Service/Any Business, Any Path/Any Network or Any Device. So, what are some key trends to watch in the development of potential Big Data strategies?

Big Data Solutions Will Expand and “Real-Time” has Started to Evolve:

Most companies today now have some form of data and know how to store and process that data. Now comes the important part in quickly delivering that data into Big Data analytic solutions designed to make better and more rapid business decisions for its recipients. The focus is speed and how fast can data be collected, modeled, managed, synthesized and delivered from individual POC’s (Points of Contact) expanding to Real-Time applications across the entire enterprise. It now just comes down to the accuracy of the data and speed processing capabilities.

To serve as an example, networks now have moved to and become mobile where in many cases “real-time” analytics are now a requisite to keep up with network demands, loads, etc. that impact functionality. In short, stream processing of data now has become essential in building and quickly delivering data that can be modeled into effective analytic tools/problem solvers (i.e., data is now able to be processed continually, vs. batch data that will be processed at a later time). New tools include Spark, Storm, Kafka.

Basic principles to “Real Time” or stream data include:

- Make deployment to POC’s / Enterprise easy
- Develop real time data processes that will stream as they occur
- Stores streaming data in a fault-tolerant way to ensure reliability etc.

- Develop efficient protocols geared towards scalability across the enterprise

Cloud Solutions will Power and Foster Big Data Solutions

With the advantages of cloud computing and the ability to support the Internet of Things (IOT) creation of Big Data solutions will continue to be enhanced. Primary drivers include the capability to generate, produce and deliver solutions timely and more cost-effectively. What other current technology can make this claim? Advantages are becoming more visible as open-sourced software such as Hadoop is now providing seamless solutions. Technology and Software capabilities are now becoming more apparent as the enterprise can now couple Big Data with IOT. It is estimated that the growth in IOT and of connected devices will exceed 50 billion by 2020. This trend will continue into the foreseeable future.

Some new things to look for:

- IOT and Smart Connected Homes
- Artificial Intelligence and Machine Learning
- More software-defined security capabilities
- Augmented Reality (AR) & Virtual Reality (VR)
- Creative offerings and use of On-Demand Services
- Intelligent Apps driving Humanized Big Data (Visual, Empathetic, Qualitative)

Conventional or what we think of Traditional Databases will be Revolutionized

RDBMS systems have been in place and have dominated the database sphere for many decades. RDBMS systems were originally developed as a means to disseminate structured data. Simply, structured data is comprised of a series of tables that are designed and to recognize relations among stored items of data/information (i.e., relational model or “schema” organized around records).

Today RDBMS systems have matured into new ways of how we gather, view and model data. Now data can comprise of structured, unstructured or multi-structured information. The new nuance here is that data is now collected from a multitude of new sources. These new sources can include (not limited to) social media data, IOT, or mechanical/electronic devices with sensors. With today’s technology and capabilities, data reporting is viewed through a prism from “day-to-day,” “hour-to-hour” now up to “millisecond-to –millisecond” reporting with accuracy. Big Data is now part of everyday life. As such, data is now taking on a new meaning, and the traditional ways that data and databases were used has now changed because technology has revolutionized and transformed the way data is used.

Some thoughts:

- Databases that contain big data will migrate to self-service big data applications
- Future user requirements for IOT applications will demand accuracy, scalability and reliability
- No-SQL databases such as MongoDB, Cassandra will be implemented by more vendors and graph databases such as Neo4j will gain in capability and popularity

Now that we have discussed a few thoughts we will need to discuss how to develop Big Data strategies. A few points to consider:

Data is not Created Equal – Choose Data Wisely: The world of and creation of data has changed drastically since the 1990’s. Data and the volume of data that is available will continue to grow at an accelerated rate for the foreseeable future. Data can come in many forms and appear in many ways. Choosing data wisely is a key foundation of any data strategy. Developing the correct data strategy should include purpose, need and will the data be actionable. Additionally, the core objective (i.e., data choices) that companies or the enterprise should try to address is a more comprehensive view about the specific business problem(s) and or the opportunities that need to be addressed. The central question to ask, “Will the data solve the problem?”

Data Modeling Should Be Purpose Driven - Will it predict and can it optimize business outcomes? Let’s agree data modeling can become very sophisticated. Therefore, the simpler the model, the better it can serve the organization and managers who have to work and make decisions. In structuring the data model, the organization must first identify the business opportunity and how the data model can best predict/optimize/improve performance. This approach can be termed as a hypothesis-led model that can generate faster outcomes as it can form practical data relationships that can be more easily understood by managers who can then develop the best business plan moving forward. At the beginning of the process develop the least complex model (i.e., hypothesis-led) and then move to a more complex approach that can predict and optimize outcomes.

Organizations Must Transform Big Data Capabilities – It Boils Down to Culture: New Big Data approaches run the risk of the organization/department not trusting new types of data-based models. Therefore, once new data models are introduced the organization must show how these models align and explain the capabilities and new tactics by developing tools and “data

blueprints” for a better understanding of how to use the data and realize business success. Using Big Data and the new models requires thoughtful and careful organizational change. Some tools / data blueprints could include:

- **Develop data that has business relevancy** – New data models must be able to be quickly understood by the frontlines. Remember data models are designed by data experts and the models must sync with day-to-day and decision-making processes.
- **Develop data models that can be embedded within the business** – The goal here is to make data transparent in terms of new models and practices. Data or data-driven business insights need to accomplish business goals such as (not limited to) improving marketing effectiveness, risk management or operations. Organizations must separate the statistic/data modeling experts from development and IT, and the organization must understand that Big Data or analytics must be viewed as central to solving problems and identifying opportunities.

To summarize, big data and its use have now become a top priority for corporate leaders. With new technologies and capabilities, the use of data has now transformed the way companies do business and more importantly how companies develop competitive differentiation. Now, this INSIGHT is not the end-all in discussing Big Data... It just serves to add to the conversation. But one thing is for sure Bid Data is here and is growing!

“There are many sources that predict exponential data growth toward 2020 and beyond. Yet they are all in broad agreement that the size of the digital universe will double every two years at least, a 50-fold growth from 2010 to 2020.”(Source: InsideBigData February 2017)

At SITEK we understand data and the importance of developing and implementing a Big Data strategy. Are you sure your data strategy is delivering Competitive Advantage for you?

SITEK Can:

- Provide** and leverage specialized expertise, methods, and approaches in your development efforts
- Offer** creative solutions and development know-how in meeting your business challenges and needs
- Deliver** leading and proven development “practice-sets” that are designed to create seamless, successful and effective business strategies that will drive success for your organization

Please feel free to contact **SITEK** so that we can discuss your business needs, priorities and offer solutions that are designed for success: www.siteksolutions.com.

About SITEK Inc., founded in 2006 and headquartered in Lexington, Kentucky, SITEK provides technology-driven solutions for clients large and small. SITEK has delivered solutions for global clients in diverse industries including; Healthcare, Manufacturing, Utilities, and Education. SITEK also provides innovative solutions to technology staffing needs. SITEK has the experience to place qualified candidates in the U.S. and internationally, delivering the right resources for any company.

SITEK – Core Competencies

- System Architecture and Design
- Application Development
- Project Management
- Document Management
(SharePoint/ImageNow)
- Testing and Quality Assurance
- Placement and Recruiting

SITEK – Key Differentiators

- Proven track record
- A decade of customer satisfaction
- Complete software life cycle experience
- Experienced in diverse technologies
- 100% Minority owned small business
- Located centrally with global reach

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