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Big data makes big waves

In 2019, Big Data is big business. Every day, we produce more and more data, from phone calls, transactions, Google searches and meteorological data, to name just a few. The sheer volume of it is overwhelming, and advanced new technologies are needed to keep up with capture and storage needs, not to mention analysis. The market is booming, and there are many opportunities for those ready to grab them.

Big Data has been big news for some time now, but, like NewSpace, it's one of those phrases that still borders on the wishy-washy when it comes to definition. A 2016 definition is reported thus: 'Big data represents the information assets characterized by such a high volume, velocity and variety to require specific technology and analytical methods for its transformation into value.'

The term Big Data has been in use since the 1990s and refers to data sets too large to be processed by commonly-used software tools within a reasonable timeframe. The challenges include capturing this data, storing it, and timely analysis. Such data might include Internet searches, urban informatics, medical datasets, weather data, genomics, business informatics, etc. Today, anything that can be recorded digitally can be included in the Big Data world.

According to some reports, the amount of data being collected has roughly doubled every 40 months since the 1980s, thanks to the increased data capture capabilities of cheap and numerous information-gathering devices, including Smartphones, IoT sensors, cameras, and wireless sensor networks, among others. Now, global data volumes are expected to grow from 4.4 zettabytes in 2013 to 44 zettabytes in 2020, according to the International Journal of Modern Education and Computer Science.

Big Data via satellite

There's a lot of change in the satellite sector right now; high throughput (HTS) is moving to extreme throughput (XTS), small satellites and mega-constellations are increasingly taking centre stage, while traditional satellite markets such as broadcasting are being threatened by new technologies like OTT. Big Data, therefore, represents a huge opportunity for satellite operators to forge a major new market for themselves, with globally ubiquitous high bandwidth needs.

According to NSR's *'Big Data Analytics via satellite, 2nd Edition report,'* downstream Big Data solutions are set to continue sustained growth over the next decade, driven largely by Earth observation and M2M/IoT applications in several key markets. Big Data analytics via satellite are expected to generate almost US$18.1 billion in cumulative revenues by 2027, owing to increasing demand from end users in the transportation, government and military and energy sectors.

The highest increase in usage across key verticals will

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be seen in use of satellite imagery for data analytics applications, growing at an impressive 23.5 percent CAGR through to 2027. “However, this is only half the story, as machine-to-machine communications and IoT technologies contribute a significant portion of the revenue opportunity as well,” commented Shivaprakash M, NSR Analyst and report author. “Whether this demand is for fleet management solutions, financial instruments, or decision tools; there is a significant shift in the industry. Multiple players along the value chain are focusing on squeezing maximum value out of pixels and bits.”

As technology advances, partnerships along the value-chain are driving growth in this sector and spurring new applications. As the line between Earth observation and M2M/IoT data applications blurs and highly integrated datasets become prevalent in the industry, a key strength for Big Data companies will be the ability to remain data-agnostic in their product/service offerings. As satellite operators begin to transition towards digitalized operations, a rise in demand for high throughput satellite (HTS) bandwidth and the promise of low Earth orbit (LEO) constellations will also drive the revenue opportunity for Big Data network utilization services.

Overall, satellite Big Data analytics will reach close to a US$3 billion revenue opportunity by 2027, with 54 percent from M2M/IoT applications and 46 percent from Earth observation applications. Through the next decade, while North America will continue to have a lion’s share of the revenue opportunity, demand in other world regions are expected to grow at an accelerated pace as more markets in more regions embrace the digital paradigm.

Big Data applications

Of course, humans have always collected data in one format or another. In decades past, that data was of a much more manageable volume and type, which made it less complex to process for everyday applications. Today, the applications for Big Data are potentially endless, as is the volume of data being collected.

Government

Governments around the world stand to gain immensely from the appropriate analysis and application of Big Data. Enhanced efficiencies in costs, productivity and innovation are all up for grabs, however, these advances require many different arms of government to work together effectively. Births and deaths, parking, finance, road maintenance, taxes, voting and property management are just some of the data-generating aspects of government responsibility.

Healthcare

In the world of healthcare, Big Data can literally change lives. The quantity of data produced in healthcare systems around the world is staggering, leading to fragmented systems that are ineffective. Big Data has already helped patients and practitioners alike by providing clinical risk intervention, predictive analytics, waste and care variability reduction, automated reporting of patient data, personalizing healthcare, and much more.

Manufacturing

The global manufacturing sectors also stand to gain from Big Data. Improvements in product quality and supply planning, enabled by appropriate Big Data analytics, could provide great financial boosts for those companies in the know. Predictive manufacturing enables businesses to near near-zero downtime for expensive machinery, with planned maintenance replacing emergency repairs almost entirely. Well-utilised sensors for monitoring key processes could make all the difference to manufacturing businesses going forwards.

Internet of Things (IoT)

The IoT and Big Data work in harmony to deliver device interconnectivity. For remote sites, such as VSAT installations, power lines, oil and gas sites and agricultural areas, IoT devices can be utilized to gather sensory data which can be analysed to provide greater operational efficiencies and improve monitoring capabilities. Working hand in hand, the IoT and Big Data are set to change the world for millions.

An artificial future

The sheer volume of data being collected today renders processing and analysis extremely complex. The computing power alone required to turn Big Data into meaningful information that businesses, governments and other organisations, is immense. In order to continue to meaningfully utilize Big Data, not only do computers need to become more technologically advanced, but algorithms and other analytical tools need to take a step forward.

Artificial intelligence (AI) and machine learning are key in continuing to drive Big Data forwards. With these technologies, Big Data can become ever-more capable of delivering vital, actionable intelligence across the board. With AI, Big Data analysis can be achieved faster and more efficiently, and connections missed by previous algorithms or human observers can be made. Over time, AI can better learn unique systems, which will enable vastly-improved capabilities specific to each system. The two technologies, AI and Big Data, are inexorably linked. ■

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