Real-Time Big Data Analytics + Internet of Things (IoT) = Value Creation

January 2015 Market Insights Report

Executive Summary

According to a recent customer survey by Vitria, executives across the consumer, enterprise, and industrial sectors see enormous opportunity with real-time Big Data analytics to drive business outcomes for their Internet of Things (IoT) initiatives. In many cases, executives are already deploying or planning to deploy first-generation real-time analytics for IoT within the next 12 months. The vast majority of executives see real-time analytics as a core investment strategy and as a top IoT initiative for their organizations.

Key insights from this survey include:

1. Maintenance and monitoring are top business needs.
2. Real-time analytics for IoT projects is becoming mainstream while IoT analytics is becoming a strategic area for investments.
3. Streaming analytics is emerging as a key IoT initiative.

This presents a new set of analytics challenges and questions, such as what sources of data to measure and monitor? What analytics features and capabilities to invest in? What analytics benefits to expect and to achieve? How to measure and attribute these benefits to the top line and bottom line? How to operationalize real-time analytics? And most importantly, how to evaluate if your organization is ready for real-time Big Data analytics?

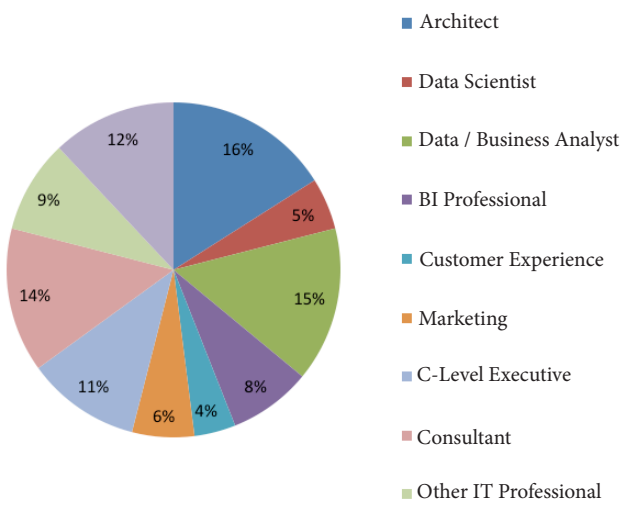
About the Survey Respondents

The survey was conducted with executives across telecommunications, IT software / hardware / services, financial services, insurance, energy, healthcare, pharmaceuticals, government / public sector, manufacturing, supply chain, retail, transportation & logistics, education, and more.

A total of 235 customers participated in the survey of which 29% were from the telecommunications industry, 26% from the IT sector, 14% from the financial services & insurance industries, 21% from industry verticals such as energy utilities, healthcare & pharmaceuticals, manufacturing / supply chain, and transportation & logistics, and 10% from the government / public sector and education.

Across the industries surveyed, 11% were C-level executives, 16% were architects, 15% were data / business analysts, 14% were professional consultants, and the remaining fell across marketing and data scientists, which suggests that IoT demand and perceived value is varied across different areas of the business.

Figure 1: Job Function / Role Segmentation of Survey Respondents



Business Imperatives

Use Cases

Asked to name the top use cases they were grappling with, predictive maintenance, network monitoring, service assurance, and demand response management were the top business needs identified by the survey respondents. This suggests that organizations are initially looking into operational efficiency initiatives, such as asset utilization and cost reduction, as the first wave of project commercialization followed by business initiatives, such as revenue generation and customer satisfaction, as the second wave.

Considering that the top anticipated benefit from real-time Big Data analytics for IoT initiatives is predictive maintenance, it is not surprising that the majority of survey respondents said that they not only have a need to operationalize predictive models on real-time data, but are also actively exploring how to implement them. More than 72% of the survey respondents are active in this area.

Figure 2: Anticipated Real-Time Big Data Analytics Benefits

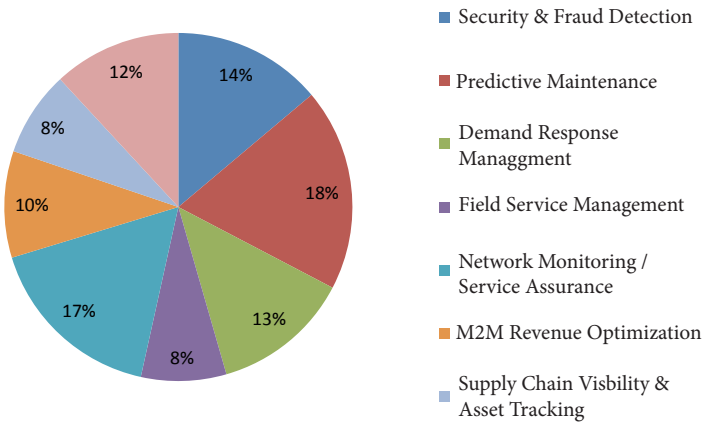
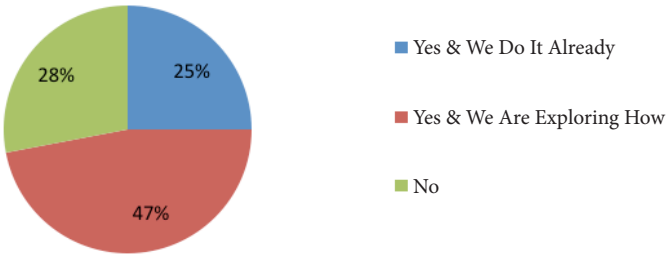


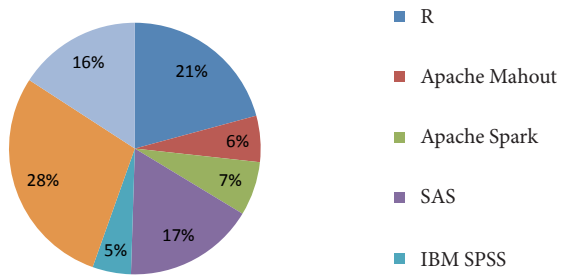
Figure 3: Need to Operationalize Predictive Models on Real-Time Data



Tools to Develop Predictive Models

Approximately 66% of the respondents are either using or planning to use open-source, R, and SAS to develop their predictive models for machine learning. However, it is worth noting that these tools, though they allow data scientists to build predictive models on historical aggregated data, do not support the deployment of the predictive models against streaming data for run-time prediction. Such a deployment requires porting the predictive models from the modeling environment of choice to a streaming analytics platform capable of providing real-time predictions.

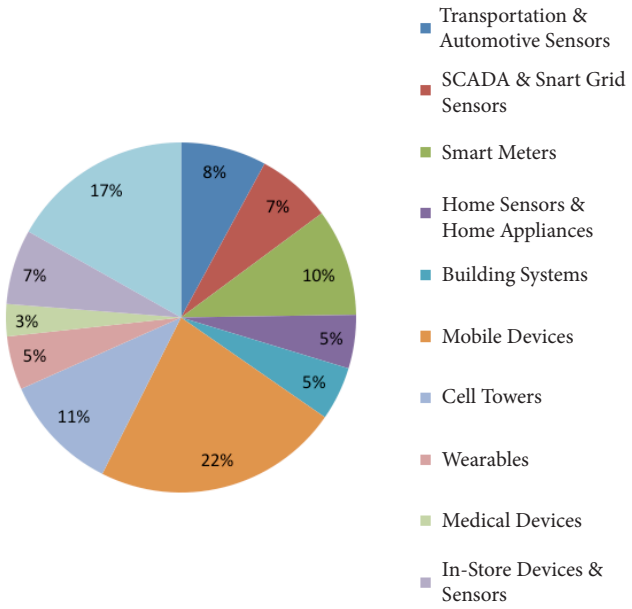
Figure 4: Tools & Technologies to Build Predictive Models



Multiple Data Sources

When they were asked to name their top sources of data, 22% of the respondents stated mobile devices as their top IoT data source, which makes sense considering the prevalence of mobile devices and sensors. Additionally, approximately 11% of respondents identified cell towers and 10% identified smart meters as their top IoT data sources. As more machines and sensors are getting connected to the network with more intelligence, data sources from sensors in transportation, automotive, healthcare / medical, and energy have begun to emerge. With the adoption of Big Data analytics, cloud, and mobile in IoT, businesses will be challenged to manage such disparate data sources to enable timely outcomes that are impactful.

Figure 5: Top IoT Data Sources



Positioning for Growth & Differentiation

Real-Time Analytics for IoT Becoming Mainstream

Of those surveyed, 48% noted that they currently have an active real-time Big Data analytics project underway. In addition, about 37% of the respondents plan to actively engage in a real-time analytics project(s) within the next year. This is further indication that companies are seeing and recognizing the value of real-time Big Data analytics for their businesses.

Core Investment Strategy

IoT analytics is becoming a core investment strategy for various organizations, as over 44% of respondents are looking to invest in the areas of visualization, analytics, and automation to leverage analytics as a core competency to deliver better outcomes and to drive differentiation for their product and service offerings.

Real-Time Analytics for Real-Time Actions

Streaming analytics is rapidly emerging as a key IoT initiative with over 20% of the survey respondents indicating that they are considering a stream processing / event processing solution for their IoT initiatives, further demonstrating a growing realization of the need to glean real-time insights that can be acted upon in real-time as it happens. For some organizations, however, being able to consolidate data in Hadoop or a Data Warehouse to perform near real-time and batch analysis constitute "real-time" Big Data analytics. Hence, 22% of respondents said that they were considering BI solutions or Data Warehouses for real-time Big Data analytics.

Figure 6: Level of Importance of Real-Time Big Data Analytics Projects

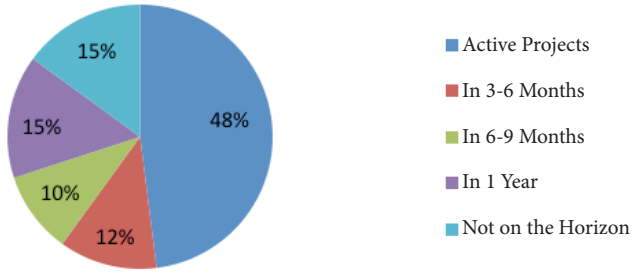


Figure 7: IoT Resource Allocation

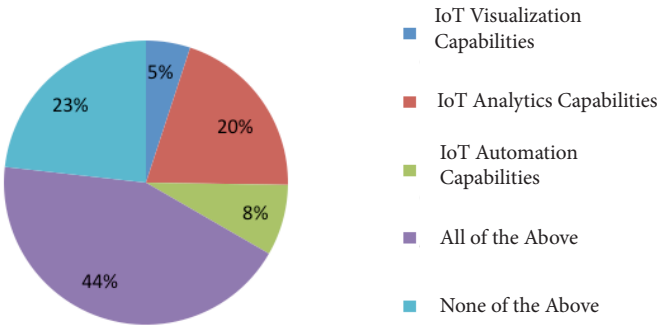
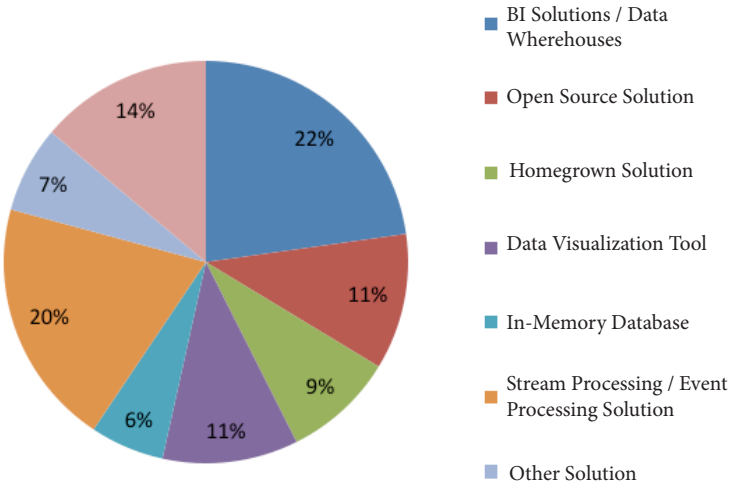


Figure 8: Real-Time Analytics Solutions



Conclusion

Organizations across consumer, industrial, and enterprise sectors are rapidly evaluating and implementing early programs to realize immediate value from the Internet of Things (IoT). While most of the initial implementations are weighted towards cost reduction, maintenance, and monitoring; the lure towards compelling real-time services and differentiation are driving investments in predictive and streaming analytics for timely decision-making. Overcoming barriers to operationalize disparate data sources with relevant context will not be easy. Promisingly, the race is on to unlock the value in IoT with real-time analytics to drive more insights and impactful outcomes.

Vitria provides the industry's leading streaming analytics software platform, empowering partners and customers alike to analyze streaming Big Data, complex events, and business processes in the proper context and in real-time. The result is faster, better decision-making with immediate automated actions. With a rich heritage as a technology pioneer, Vitria's award-winning streaming analytics platform provides operational intelligence for many Global 2000 companies.

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