

# IoT Analytics: Striking the Right Balance Between Edge and Hub

IT Leaders are paying plenty of attention to the Internet of Things, and with good reason.

The Internet of Things (IoT) is no longer a novelty. In just a few years, it has emerged to become an important strategic initiative across many industries, at companies large and small.

IoT projects are far beyond the pilot stage and have spurred IT leaders to implement hybrid strategies, processing some IoT data at the edge of the enterprise, while sending much of it to a central hub for deep analytics, according to a recent IDG Quick Pulse survey. As competition heats up, the companies that can find the right balance between edge and hub are likely to fare best.

The uses to which IoT data are being put are many. According to the survey, organizations are focusing on an average of five current and future IoT projects. The top implementation is connected products and analytics (60%), followed by predictive maintenance (55%). It's also telling that companies are potentially utilizing IoT data in myriad other ways, demonstrating that the same IoT data, when combined with other data sources, can be leveraged to drive additional use cases.

"Usually organizations start with one specific use case, such as continuous asset monitoring, and then by incorporating additional data sets and

building in machine learning capabilities, can effectively expand to other use cases such as predictive maintenance," says Vijay Raja, Solutions Marketing Lead for IoT at Cloudera.

As IoT initiatives have taken hold, IT leaders have had to confront the challenges of managing data generated by IoT projects. In the wake of DDoS attacks such as the Mirai botnet, which was launched from IoT devices including security cameras, security is not surprisingly the number one concern.

Although security tops the list, the results indicate companies face a balancing act between multiple priorities. "Organizations need a data management and advanced analytics platform that can not only scale to the volumes and variety of data that IoT generates at a lower cost per terabyte, but at the same time ensure complete data security, encryption, compliance, access control, authorization, and authentication," says Raja.

To manage their IoT data, organizations are landing it in one of four destinations, each with its own trade-offs. Traditional databases are the main target (57%) today, but might not be the best choice for IoT and sensor data, as they generally do not scale easily and cost-effectively. Big data platforms and scale-out architectures are a popular destination (47%), as are public clouds (43%), and NoSQL databases (42%). It's worth noting that big data solutions deployed on hybrid cloud architectures have been gaining interest in recent years, particularly for IoT implementations.

## The Hub and the Edge

Because much IoT data is generated at the 'edge' or on-premise, such as a factory floor, oil rig, or customer point of sale, it makes sense to aggregate, filter, or process some of the data near that edge in order to minimize network congestion, to lower latencies and associated costs.

This is particularly relevant for use cases when sub-millisecond response times are needed to react to an anomaly and optimize operations at the edge.

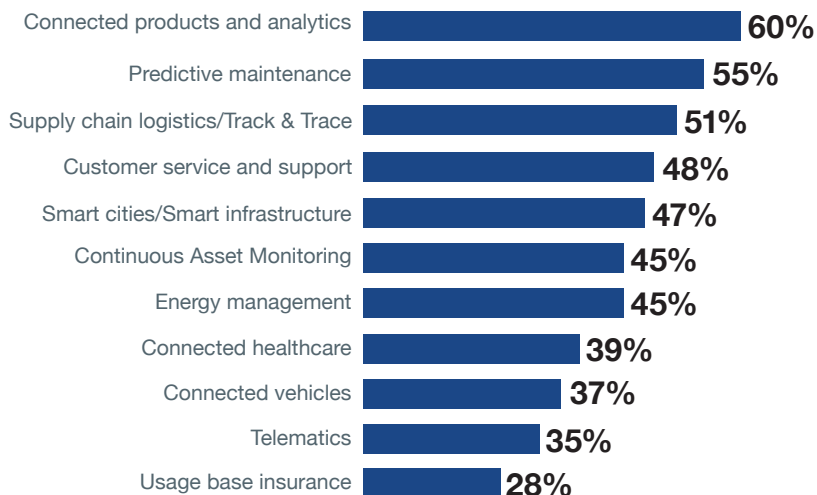
Even though there are definite advantages in



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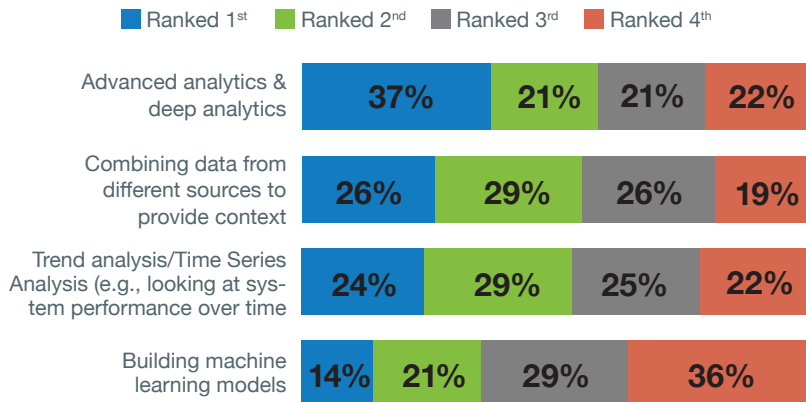
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## IoT Use Cases



Source: IDG Research

## Top Reasons Data is Brought back to the Hub



Source: IDG Research

processing some of the data at the edge, organizations will still need to bring a lot of their IoT data sets into a centralized data store to drive advanced analytics and machine learning. Organizations are bringing in IoT data sets and adding context to sensor data by combining it with other enterprise data sources such as CRM, ERP, and supply chain systems—or data from external sources such as weather or traffic information—to drive compelling insights.

Sending IoT data to a central hub where it can be aggregated with data from multiple sources is likely to yield analytical insights with high strategic value. According to the survey, the majority of data (56%) is being sent to a central hub for analytics, while 44% is being processed or analyzed at the edge.

The top reasons to bring data back to a central hub are ranked in this order (see chart above):

- Advanced analytics/Deep analytics
- Combining data from different sources to provide context
- Trend analysis/Time-Series analysis
- Building machine learning models

The best approach for organizations moving forward will be a hybrid analytical approach, which brings out the best of both the hub and the edge architectures. Finally, machine learning models and lessons learned at the central hub might be pushed back out to the edge, so that intelligent decisions and additional adjustments to manufacturing processes can be made, in real time, closer to the source.

## The Cloudera Solution and Navistar Use Case

Cloudera provides the modern platform for machine learning and analytics that can help strike the right balance between the edge and the hub. At the hub, the Cloudera solution brings in data from multiple sources to elevate the strategic value of the insights that are obtained.

And with key partners, Cloudera provides an end-to-end architecture from the edge to the hub. Among companies benefiting from this approach includes Navistar, one of the leading automotive manufacturers, who is tracking the performance of 325,000 trucks in real-time.

The vehicle maker brings sensor data from its trucks into a central hub where it is aggregated with data from other sources to enable predictive maintenance, system diagnostics and management, and route optimization. From the hub, Navistar customers access analytics as a service, monitoring their trucks in real time from smartphones and tablets. The gains are significant: Navistar minimizes maintenance costs and vehicle downtime by 40%.

## Conclusion

As companies generate increasing amounts of IoT data and discover the best ways to glean valuable insights from it, many will find the hybrid approach to IoT analytics delivers the greatest benefits. The key to a successful strategy will be finding the right balance between hub and edge. To this end, the right data management platform is essential. It must be highly secure, cost-effective, and scalable—and it must deliver outstanding performance both at the edge and at the hub.

To view the On-Demand webinar with IDC on Edge Vs Hub, visit:

<https://resources.cio.com/ccd/show/200051390/01537760186957CIOHCDEJPQ7NU/>

To read about the Navistar customer case study, visit: [www.cloudera.com/more/customers/navistar.html](http://www.cloudera.com/more/customers/navistar.html)