INSIGHTS FROM THE EDGE

ACTIONABLE ANALYTICS THROUGH REAL-TIME EDGE AND IoT DATA TRANSFORMATION

CLOUD**E**RA | Microsoft Azure

A RISING DATA TIDE

Now that big data ingestion and transformation have become a benchmark for highly competitive businesses, industry leaders are looking towards the next stage of this data-driven evolution: **Industry 4.0**.

Harnessing analytics from granular internet of things (IoT) and sensor data is the next progression in the push towards deeper, more relevant business intelligence. Companies that translate their data-in-motion into meaningful, actionable insights — in real time — are positioning themselves as leaders in their fields.

To help understand the accelerated growth rate of the IoT, IDC anticipates that there will be at least 30 billion connected devices worldwide by 2020 — providing 440 times more data than was possible in 2006. This exponential increase in data generation is a welcome advance, but the data itself remains significantly under-utilised.

Harvard Business Review insights reveal that only 50% of structured data is actively being used to inform businesses' decision-making. And only 1% of unstructured data is being used in these instances.[1]

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[1] "What's Your Data Strategy?" by Thomas H. Davenport, *Harvard Business Review*, April 18, 2017.

It's understandable that businesses are struggling to maintain adequate data transformation systems, as technology delivers increasingly granular data from so many collection points. Translating this flood of data-in-motion from proliferating edge sensors and IoT devices is an understandably difficult task.

But its difficulty shouldn't overshadow its importance. Consider the edge that your business could gain by utilising 70%, or even 85%, of your available data. If this potential is driving your business to maximise its data collection, it's critical that you employ the adequate tool set to properly analyse and create actionable insights.

Cohesive data-in-motion transformation solutions do exist, and they can help you to bridge this divide between high-volume IoT/sensor data ingestion and relevant, informative output. A capable data management system, serviced by a multi-tenancy cloud platform, will translate what your data-in-motion is telling you, apply it to the unique insights you seek, and provide your team with real-time access, from anywhere.

SURVIVING THE INFLUX

THE REPERCUSSIONS OF EDGE AND IoT DATA OVERLOAD

It's easy for a business to get tangled up in data influx, suddenly finding the majority of its IT energy wasted on the cumbersome burden of intake, rather than analysing results and creating insights that guide business growth.

Even if a business's internal data collection proves agile enough to scale alongside its own growth, a host of other issues can arise:

- Subjecting raw data to descriptive analysis is complex, and can consume massive amounts of human time and energy

- Real-time IoT data processing requires greatly increased infrastructure to handle peaks in capacity, while sitting idle during low-volume periods

- Regulatory pressure is forcing businesses to implement increasingly stringent security compliance and data provenance

- Moving data to or from data centres to the cloud presents portability conflicts among public, private, hybrid, and multi-cloud platforms

But the biggest problem for businesses today is that failing to keep up with the technological advances in edge and IoT data management greatly limits their growth opportunities.

Effective data interpretation can be used to significantly increase operational efficiencies—including things like shortened downtime periods in manufacturing industries, and streamlined development cycles for SaaS providers. Applied to external operations, comprehensive data collation has the potential to drastically increase our understanding of consumer behaviour, the benefits of which can hold limitless predictive capabilities.

Business leaders must ask themselves:
Are we gaining every possible advantage from our edge devices?

CONQUERING DATA OVERWHELM

AGILE EDGE SOLUTIONS FOR RELEVANT, IMMEDIATE ANALYTICS AND INSIGHTS

So, what do today's edge data solutions look like?

Ideally, yours should:

- Provide immediate, real-time access to actionable insights
- Collect and transform edge and IoT data from limitless, global points of origin
- Be accessible via on-premises, hybrid and multi-cloud environments

Until recently, this level of access and insight would have been considered impossible. Today, it's not only within reach, it's a necessity to stay relevant in the modern business world.

Your perfect data-in-motion management tool set should provide manageability, flexibility, security and adaptability. To achieve this, there are several key attributes to seek out in your data-flow platform:

Open source

Systems built with 100% open-source technology will protect you from vendor lock-in, saving your business any switching costs if you outgrow or shift direction from your current edge and IoT data management needs.

Code-inclusive

Pre-built processors will provide comprehensive connectivity, allowing edge data to flow visually, without requiring any additional code. The time and cost savings when developing IoT applications can be significant.

Legally compliant

Data provenance and tracking are being subjected to intense legal scrutiny, and businesses must navigate the shifting requirements surrounding consumer privacy. Stay ahead of potential issues with a platform that provides out-of-the-box data lineage.

Scalable

Avoid common performance bottlenecks that negatively impact workflow, efficiency and customer retention. Seek a scalable platform that prepares you for the potential growth of your company's data needs.

Highly intelligent

Keeping up with heavy IoT/sensor data ingestion requires constant attention. Make sure your solution utilises AI functions to process and react to edge and IoT data quickly and efficiently.

MiNiFi capable

If your business needs to unite edge data streams from a large number of distributed, connected devices while retaining the core features of Apache NiFi, make sure your system has MiNiFi capabilities. You might also consider an edge flow manager (EFM) interface, which allows you to change the behaviours of a specific set of MiNiFi agents in the field to your exact requirements.

Multi-cloud compatible

Finally, all these capabilities need to be reliably accessible across all your hubs and mobile devices. Select a data transformation solution that integrates seamlessly with a world-class cloud environment to ensure it operates conflict-free.

Finding a data management platform that combines these attributes will set you up to comfortably meet the challenges of data-in-motion, real-time stream processing, data provenance and data ingestion from IoT — and use that information to focus on driving your business forward.

How agile + secure is your IoT environment?

Is your edge data management:

- **Elastic?** Does it independently size your compute and storage requirements, growing and shrinking clusters dynamically? Using a platform like Cloudera, you'll only pay for what you use on ad hoc transient workloads.

- **Hybrid/multi-cloud?** Preserve flexibility and data portability, while minimising cloud lock-in, on any one of the three major public cloud providers, or your own private cloud.

- **Enterprise grade?** Reduce risk with comprehensive manageability, availability, security and governance, and keep your operations streamlined, even under big-data workloads.

Is your cloud connection:

- **Global?** Does its footprint include enough regions to ensure seamless connectivity, globally? Microsoft Azure covers more regions than any other cloud provider.

- **Compliant?** With over 70 compliance offerings, Azure also boasts the largest compliance suite in the industry.

- **Trusted?** With more than 90% of Fortune 500 companies entrusting their business to the Microsoft cloud, you can feel confident knowing that your data is secure.

YESTERDAY'S IMPOSSIBILITY IS TODAY'S NECESSITY

ACTIONABLE REAL-TIME INSIGHTS UNLOCK YOUR BUSINESS'S TRUE POTENTIAL

Transforming IoT data from thousands of sensors into usable intelligence is a complex process — but by employing the proper tools to manage and transform your data through a cloud platform that adapts to your usage, you can minimise expense and scale your data stream seamlessly alongside your business.

Partnering a data system like Cloudera with Microsoft Azure's cloud services allows you to merge comprehensive enterprise-level data flow management with a secure multi-tenancy cloud environment. By doing so, you can expect to see a number of positive impacts on your business, including:

Real-time insights and actionable intelligence, on-demand.

Cloudera has the capacity to ingest, curate and deliver immediate, relevant analytics, at any scale.

Ease of management and security of data from edge to cloud to hub.

Using a truly enterprise-grade platform provides a level of functionality and security you simply won't find in consumer-grade options.

Reduction of data integration development time.

The only edge and IoT data solution that offers more than 260 pre-built processors, Cloudera provides comprehensive connectivity and requires no additional code. This will free up your IT team to focus on your business's growth.

Ability to build a data architecture that adapts to IoT scale.

The flexibility of Cloudera and Azure provides full scalability, so businesses can stay agile and reactive as their needs evolve.

Compliance with full governance of streaming data.

Operate assured that your data harvesting practices meet the highest standards of traceability, even for data-in-motion, right out of the box.

CLEARSENSE

DESIGNING HEALTHIER EDGE DATA SYSTEMS

Clearsense is a smart data organisation that helps healthcare providers realise measurable value from their data.

Situation

Inability to integrate and analyse multi-format data streaming from IoT (wearable sensor devices), electronic medical records (EMRs), and hundreds of other new sources of data (in a pre-Apache Hadoop/NiFi tech landscape).

Healthcare practitioners understood the medical challenges that could be solved by accessing and transforming data from edge and IoT devices, but they were not data architects. Data architects could build systems, but they lacked medical expertise on topics such as EMRs, signs of patient distress or hospital billing and reimbursement processes.

Challenge

Collecting and transforming data-in-motion from wearable IoT sensor devices, to triangulate with EMRs and other data sources, in real time.

Solution

Working with Cloudera, the Clearsense team became the first to deliver smart, real-time streaming data to its healthcare customers. Its Inception™ product made data available for critical decisions in three major areas:

1. **Clinical decisions**
   Amassing all relevant patient information in real time for early detection of patient deterioration, to reduce catastrophic consequences and optimise outcomes.

2. **Financial decisions**
   Tracking organisational KPIs related to financial goals.

3. **Operational decisions**
   Identifying and eliminating variation in the care delivery processes, providing visibility into current performance to help identify opportunities for improvement.

CLEARSENSE

DESIGNING HEALTHIER EDGE DATA SYSTEMS (CONTINUED)

Results

Leveraging IoT data-in-motion through Cloudera platforms running in the cloud, hospital systems saw significant gains in operational efficiency, financial outlay and, most important, patient care.

Once this data architecture was constructed, cost-efficiencies allowed Clearsense to offer healthcare predictive analytics to smaller, rural and underserved providers, who wouldn't be able to afford a major up-front investment with a proprietary vendor selling a software license.

There are more than 2,000 'rural' (50-bed, 75-bed and 100-bed) hospital systems in the United States alone. Prior to the advent of Clearsense Inception and the Cloudera suite of products, those hospitals would not have had access to advanced analytic technologies. Now, utilising open-source software in a cloud environment with multi-tenancy and a subscription-based model, they can.

"Our relationship with Cloudera allowed Clearsense to be the first to introduce SMART Data™ to our healthcare customers. It gives them the foundation for real-time data—the same data that historically took weeks to show up in a report. We're providing that information instantaneously to our clients."

—Gene Scheurer, CEO

JOIN THE EDGE DATA REVOLUTION

WHERE CAN IoT DATA TRANSFORMATION TAKE YOUR BUSINESS?

Properly harnessing edge and IoT data to inform decision-making is rapidly becoming a requirement for industry-leading businesses. Platforms like Cloudera and Microsoft Azure provide high-relevance, actionable insights from edge and IoT data that streamline operations and fast-track growth.

Find out how these advances in data management can help your business unlock its true potential.

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