VANTIQ

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Improving Situational Awareness and Agility in Energy Management

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Improving Situational Awareness and Agility for Energy Companies Through Real-Time Digital Transformation

While there is no shortage of impressive technology available in the energy sector, there still remains a disconnect between the data companies collect and their ability to use it to prevent disasters, act quickly enough to maintain a competitive edge, and optimize their infrastructure.

To achieve success in the energy industry today, there are specific business attributes that are absolutely vital to all those who hope to maintain a competitive advantage and attain a sustainable business model for the long-term.

These attributes are **operational visibility**, **business agility**, and **grid modernization**.

In this ebook, we'll explain how the digital transformation of traditional database-centric applications into event-driven frameworks is required to provide businesses the visibility they need to:

- streamline operations
- modernize the grid
- prioritize sustainability and decarbonization
- prevent disasters

Additionally, we will explain how edge computing capabilities enable energy companies to better visualize data and make rapid use of it, thus creating the business agility and responsiveness they need to remain competitive.

Finally, we'll explain how the Vantiq platform is enabling large-scale energy management companies to solve these issues through rapid development, rapid deployment, and rapid iteration of event-driven systems and edge-native technology.

LET'S GET STARTED!

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Where Traditional Database-Centric Applications Fall Short

The architecture inherent in traditional database-centric frameworks is simply not capable of delivering the processing power necessary for companies in the energy sector to sense, analyze, and act on streaming data quickly enough to be effective.

Additionally, the siloed nature of integrating multiple technologies without a central 'source of truth' to combine and analyze all data significantly limits an organization's ability to take prompt action.

Large organizations find it nearly impossible to connect these dots while maintaining regulatory oversight and allowing these components to work both independently yet interconnectedly. The inability to separately manage components and rapidly transfer information can have dire consequences.

Furthermore, network communication latency from system overload can come to a point where servers can not communicate.

They'll often crash from data overload, putting all your organization's information in jeopardy if an unexpected system crash occurs. This requires improved network processing efficiency to ensure this doesn't happen.

WHEN SECONDS CAN MEAN LIVES LOST

In a high-risk environment like the energy sector, **poor operational visibility and delayed reaction time can result in limited decision-making, poor resource utilization, and lost productivity** at best. At worst, it can mean millions of dollars in damages and even loss of life.

It's not enough to do a historical analysis of data because it occurs after the fact. That doesn't help you take action in real-time. Furthermore, it doesn't feed any post-mortem learnings back into your infrastructure so that you can iterate and improve your operational response in the future.

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We've now learned the necessity of thinking beyond annual expectations and general awareness. The demand for real-time application platforms that can keep pace with events as they occur is greater than ever.

Increasing Real-time Visibility Through Event-Driven Architecture

As the amount of data continues to increase rapidly, so does the need to analyze, transfer, and interpret it. The increasing demand for real-time access to data and the ability to make use of it has birthed a new category of applications referred to as Event-Driven Applications.

Event-driven applications are cutting-edge, often using innovative new technologies such as IoT sensors and real-time responses triggered on the sensors themselves.

Event-driven solutions allow businesses to take action immediately before a disaster occurs and more efficiently manage energy usage across their entire grid.

In the energy industry, the ability to monitor operations in real-time can be significant, often alerting a technician to a malfunction or misconfiguration, long before it has the potential to become a melt-down.

To ensure an ever-increasing number of events can be acted upon in real-time, you need an asynchronous and non-blocking platform. Event-driven systems are implemented on a reactive framework that enables loosely coupled, highly agile applications to manage real-time data.

Instead of merely storing the data for a later audit, event-driven applications process, transform and distribute important events as they occur.

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Improving Business Agility with Edge Computing

Edge computing goes hand-in-hand with event-driven architecture. With copious amounts of data constantly being created, organizations don't just need better visibility into their operations, they also need to be able to act on that data in an expedited way.

Edge computing, derived from the need to limit data transfers to different servers, significantly expedites information transfer by bringing the data, and the computing source closer together for faster processing and delivery.

It allows for real-time processing of data. Since the systems work closely but independently, there's less latency since data is efficiently analyzed and acted upon faster. Thus, utilizing edge computing allows for better efficiency, reliability, **lower latency**, and accelerated performance.

In a **recent article**, Todd Loeppke, Chief Architect at Sungard Availability Services, said that edge computing, "significantly improves the time required to make a decision based on the data, which is critical for many use cases that utilize real-time decisions," **this is key for the energy industry.**

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A Use Case in Event-Driven Architecture and Edge Computing

Here's a real-life example of several ways an energy company can utilize these technologies to improve situational awareness and business agility.

Let's say there's a gas leak. The gas leak is then detected via thermal imagery or acoustic sensors, and a warning is immediately sent to the operational control room.

There, the operator can visualize the problem in real-time using a digital twin of the refinery. The malfunction is highlighted, showing a live data feed, maintenance history, and recommended response.

The affected area is immediately evacuated via smart alerts sent to personnel in the facility. On-premise security services are also alerted to aid in evacuation and told to be prepared should the situation escalate.

Finally, a repair drone is automatically dispatched to the leak's location while the operator monitors and tracks the situation's real-time status as it's resolved.

This entire sequence of events is self-directed by an event-driven system that increases awareness and utilizes edge computing to expedite the use of data in real-time. By coordinating how your business detects and responds to an incident, this technology increases operational efficiency **and can potentially save lives.**

This type of digital-transformation of energy operations would be impossible for a system built on traditional database-centric architecture. However, event-driven architecture is much more flexible and scalable.

Instead of storing the data, the system processes, enriches and distributes important events as they occur, providing you the situational awareness you need to manage your oil and gas operations and take action in real-time.

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How Vantiq Enables Energy Companies to Innovate Faster and Operate Smarter

Leaders in the energy sector are already aware of the limitations present in traditional operating technologies and are replacing them with a new generation of event-driven applications that use edge-native computing, and enable real-time digital transformation, built on the Vantiq platform.

CREATE MORE VISIBILITY WITH SMARTER INFRASTRUCTURE

Event-driven applications built on the Vantiq platform hide underlying complexity so businesses can focus on new business capabilities instead of the underlying systems and infrastructure.

These applications can be deployed in any environment so that no matter where your data is coming from, you're able to manage your energy operations and take action in real-time.

INCREASE BUSINESS AGILITY

Intelligently filter and process data as close to the source as possible, thereby increasing performance and reducing traffic and latency.

Furthermore, the Vantiq platform is edge-native right out of the box,

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making it easier for companies to partition their applications to multiple IoT sensors in a connected system **without extensive customization required.**

ENABLE GRID MODERNIZATION

Vantiq's low code platform allows energy companies to shorten the time to value and increase agility, allowing you to develop real-time, scalable applications faster than ever.

Vantiq enables integrated grid modernization and gives you a competitive edge by allowing you to easily convert high-level operational processes into a framework for real-time digital applications.

Furthermore, Vantiq applications can be quickly evolved as the business requirements and technologies inevitably change.

With Vantiq, you can innovate and optimize on the fly making it easier to keep up with new technological innovations and make smart decisions, during, not after the fact.

To learn more about how Vantiq can provide real-time digital transformation for your business, contact us today to schedule a time to chat.

Vantiq powers mission-critical real-time business operations with our agile event-driven architecture (EDA) application development platform. Vantiq dramatically reduces time-to-market, significantly lowers development and maintenance costs, and provides maximum agility in response to constantly changing operational requirements.

Learn more at **www.vantiq.com**

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