

Successful Continuous Intelligence in Various Industries





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Chapter 1

Overview of Continuous Intelligence

At the heart of all continuous intelligence (CI) applications is the ability to perform analytics on real-time data streams. One indication that businesses plan to use CI is the expected adoption of streaming analytics across all industries. The global streaming analytics market is expected to grow from \$10.3 billion in 2019 to \$35.5 billion by 2024, according to a report from [MarketsandMarkets](#). That increase represents a compound annual growth rate (CAGR) of 28.2 percent for the next five years.

Driving this growth is the shifting strategies that are moving businesses toward the real-time analysis of events. Information derived from real-time analytics can be used to identify anomalies and business changes as they occur. Rather than being reactive, streaming analytics lets companies take immediate corrective actions or seize opportunities that otherwise might have been missed.

Use cases that are particularly effective combine both the real-time analytics of streaming data and analysis of historical data. For example, in an industrial setting, CI applied to a key piece of equipment's sensor data could be used to determine whether a critical part is likely to fail. The information is derived in milliseconds and available in time to gracefully shut down the device without causing damage. Historical analysis of the device's IoT data could be used to answer questions such as “How many times has this device failed in the last weeks, month, or year?”

Such a combination requires different types of solutions to work together. First, a solution must be capable of ingesting the streaming data and performing real-time analytics on the data as it streams. A solution like this would require a data platform that unifies and simplifies the collection, organization, and analysis of data. It also would benefit from some type of event- or stream-processing engine such as those based on Apache Kafka. For the historical data analysis, a solution would require a database with advanced features such as in-memory technology that accelerates the analysis of large volumes of data.

CI applications that combine real-time analytics of streaming data, event processing engines, and in-memory processing are finding uses that cut across industries, including:

- ✓ Safeguarding highly regulated industries such as finance, government, and healthcare
- ✓ Improving customer engagement through personalized experiences, referral systems, chatbots, and more
- ✓ Providing predictive maintenance in asset-heavy industries

The following chapters provide a snapshot of several industries that are attaining tangible benefits by using CI—in collaboration with IBM—to improve business performance.

Chapter 2

CI in Highly Regulated Industries

Organizations in regulated industries are embedding CI into multiple aspects of their operations. The obvious challenge in such industries is gaining access to personalized data whose use is governed by privacy regulations. In such applications, special processes often are needed to procure access to that data, and additional measures must be taken to ensure the data remains protected throughout its use in a CI analytics workflow.

Organizations that address these issues can then apply predictive analytics and AI on the data to gain real-time insights upon which rapid actions can be taken.

Examples of CI in regulated industries include the following:



Finance

As the volume of global financial transactions continues to grow, detecting fraud, money laundering, and insider trading becomes more challenging. The key areas where IBM's application of CI based on AI and cognitive solutions are having the greatest impact are transaction monitoring and managing sanctions-screening alerts, due diligence reviews, and payment fraud modeling as well as conducting investigations on suspicious activities and entities.

In these areas, CI is implemented in a variety of ways, including automated systems that use AI to spot suspicious transactions in progress. CI is also being used in robotic processing automation (RPA) solutions that mimic the actions of human users to perform repetitive and high-volume tasks, freeing people to focus on higher-value tasks.



Government/Public Sector

Necessity is the mother of invention. After an embarrassing incident in which a state governor shared incorrect information about the time it would take for a rescue boat to reach people stranded in a severe flood, the local government [worked with IBM](#) to institute an emergency asset deployment optimization project. The project uses real-time and predicted weather data, historical data about asset requirements, and real-time data about the assets themselves (snowplows, boats, etc.).

Using CI on the collective set of data, the project allows the state to anticipate needs and deploy assets appropriately. For example, if heavy snowfall is predicted for a region and there are not enough snowplows to handle the load, requests for additional plows can be made to neighboring counties that are not expected to get heavy snow.



Healthcare

One broad application of CI in healthcare is to help organizations make real-time decisions about what's best for an individual based on a 360-degree view of the patient. The focus in such applications is to deliver value-based care that emphasizes outcomes.

Using predictive analytics, organizations deliver real-time, personalized guidance to patients based on the individual's health and history. An example is an [IBM predictive effort for sepsis](#), which can be a life-threatening condition that occurs when blood pressure drops after an infection. It is the leading cause of death in U.S. hospitals. Early intervention is required to limit the infection; however, the symptoms are often difficult to recognize. Using CI on medical history, prescription information, and wearables data, IBM developed a predictive model to help clinicians flag sepsis risk.

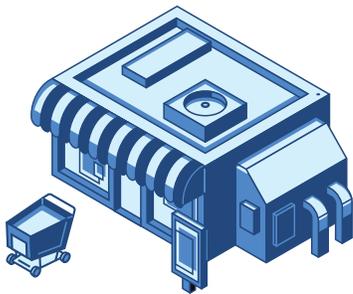
Chapter 3

CI in Customer Experience and Business

The combination of lots of available streaming data and solutions to derive actionable intelligence from that data means CI can deliver significant benefits to businesses of all types and sizes. Many businesses are looking to CI to understand their customers' needs better, provide enhanced customer experience, and deliver improved service when a customer interacts with the business, be it while passing by on the street, visiting the website, or calling customer service.

Perhaps the most exciting aspect about CI's use in improving the customer experience is that it enables innovations that were not possible before. CI's ability to make use of situational awareness in streaming data gives businesses a new tool that has not been available with traditional approaches that only mined historical data.

Examples of what's being done in different industries to improve the customer experience include:



Retail

Many use cases of CI in retail combine streaming data such as clickstreams with detailed customer purchasing histories and preferences to deliver personalized offers. The offers are most effective when delivered in real time, such as when a customer is visiting a website or is on a call with a sales or service representative.

An interesting application that demonstrates the power of CI in retail is that of Japanese vending machines. [IBM worked with one machine vendor](#) and employed CI to analyze weather data and information about the number of people passing a specific machine at a certain time. Using the derived insights, the vendor knew the right inventory to put in each machine. And it could develop a dynamic pricing model to sell the most hot and cold beverages and soups depending on the weather and user preferences. Using CI in this manner helped the vendor get the most revenue out of its machines.



Airline

Airlines are constantly concerned about the customer experience. A common way they measure success is using the Net Promoter Score, a calculation of the proportion of surveyed passengers who say they are likely to recommend an airline to others. Knowing a passenger's NPS score allows the airline to offer customized deals. Unfortunately, many passengers do not fill out a survey.

[IBM worked with one airline](#) using CI that combines historical passenger data, weather data, and a number of other flight details in real time. With the analysis, the airline can predict a passenger's NPS score and make the next best offer to retain his or her business.



Transportation

A trucking company whose mainstay business was product delivery developed [a new advertising model using CI in conjunction with IBM](#). The application uses location and weather data and adds in information about the types of people who would be driving past its trucks at certain times.

With CI's predictive analysis capabilities, the company was able to give detailed demographics and other information to sponsors who wanted to advertise on the sides of its trucks. The company generated a new revenue stream based on the data.

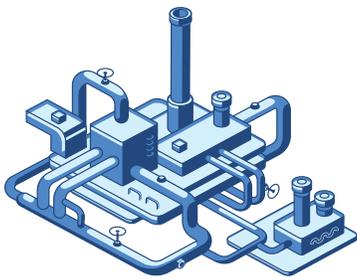
Chapter 4

CI in Operations and Maintenance

The widescale deployment of the Internet of Things (IoT) devices and smart sensors is providing a wealth of real-time data about the state of all forms of equipment. If properly used, that data can ensure businesses reduce downtime and improve operational efficiencies.

However, many businesses do not have the ability to derive insights in a timely manner from the streams of data from thousands to millions of devices. CI helps in that it can ingest the streams of data, use analytics and AI on that data, and derive information that the business can act on in milliseconds to seconds.

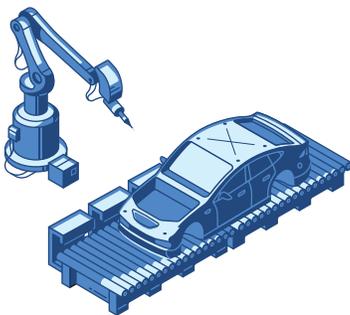
Examples of CI's potential uses and benefits in maintenance and operations include the following:



Industrial Applications

IBM is helping companies use CI in industrial applications. A common application is to move from reactive maintenance to proactive maintenance using predictive analytics to help identify potential equipment failures and thus reduce downtime.

Another emerging application is to use CI to optimize spare parts inventory. Industrial facilities must balance the need to keep a critical part on hand with having too many parts that cost money to buy and store. Using CI, an industrial plant could, in essence, set up a just-in-time supply chain approach where parts are ordered based on the lifetime probability derived from predictive analytics of IoT data.



Manufacturing

A company that moved oil and gas throughout an expansive pipeline network collected vast amounts of sensor data to help detect leaks. The system that monitored the data was generating many false positives every day.

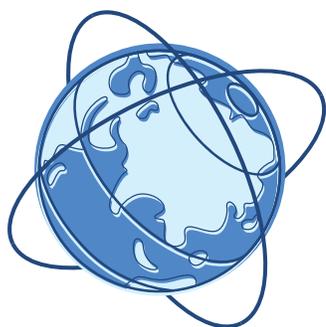
IBM helped the company develop an AI monitoring system that combines real-time sensor data with historical data on flow rate, pressure, volume, and other pipeline metrics throughout the network. The solution cut the total number of alarms, allowing each true alarm to be analyzed faster and more comprehensively, and the actual leaks addressed sooner.



Telecom

Telecom service providers need both real-time information to prevent outages and service disruptions, and the historical analysis to plan and use network resources more efficiently. On the real-time side, CI can be used to examine the billions of streaming call records looking for instances that require split-second decisions. Using historical data, a provider can examine network capacity and adaptive solutions that improve efficiencies.

IBM has worked with many telecom operators to experiment and deploy AI-driven solutions in both customer-facing and internal organizations. AI use cases include network operations monitoring and management, predictive maintenance, fraud mitigation, cybersecurity, customer service and marketing virtual digital assistants (VDAs), intelligent customer relationship management (CRM) systems, and improving customer experience management (CEM).



Next-Generation Satellite Company

IBM is working with a European satellite company that needed CI to better manage its next-generation satellites. The new satellites included many more sensors and produced much more data—and false positives—than was the case with previous-generation satellites. The company needed to analyze data to monitor operational status and determine actions if problems arose.

Existing infrastructure could not handle the workload. The solution was to use CI on the front end to ingest and analyze the streaming data for the sensors to spot issues in real time, and an in-memory database to store the data to perform analysis and spot trends. The use of CI, cloud services, and the in-memory database enabled the company to simplify its infrastructure while getting deeper insights into operational issues.

Conclusion

The applications of CI span a wide range of industries. From detecting fraud in finance and enhancing customer experience in retail to improving predictive maintenance in manufacturing and more, CI offers a wealth of opportunity to help businesses succeed.

Just as business landscapes shift continuously, companies must also constantly stay nimble to change. Organizations that embrace CI to analyze data on the fly, spot trends and root causes, and make real-time decisions can considerably differentiate themselves in competitive, saturated markets.

IBM Cloud Pak for Data

To enable predictive analytics and AI everywhere, IBM developed Cloud Pak™ for Data, a fully integrated data and AI platform that modernizes how businesses collect, organize, and analyze data and infuse AI throughout their organizations. Built on Red Hat® OpenShift® Container Platform, IBM Cloud Pak for Data integrates market-leading IBM Watson® AI technology with IBM Hybrid Data Management Platform, data ops, governance, and real-time streaming analytics technologies. Together, these capabilities provide the information architecture to scale the AI ladder and meet organizations' ever-changing enterprise needs.

Deployable in just hours and easily extendable with a growing array of IBM and third-party services, IBM Cloud Pak for Data runs across any cloud, enabling organizations to more easily integrate their analytics and applications to speed innovation. IBM Cloud Pak for Data lowers the total cost of ownership, accelerates innovation based on open source technologies, and fully supports multi-cloud environments such as Amazon Web Services (AWS), Azure, Google Cloud, IBM Cloud™ and private clouds.

For more information, visit ibm.biz/CloudPak4Data



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