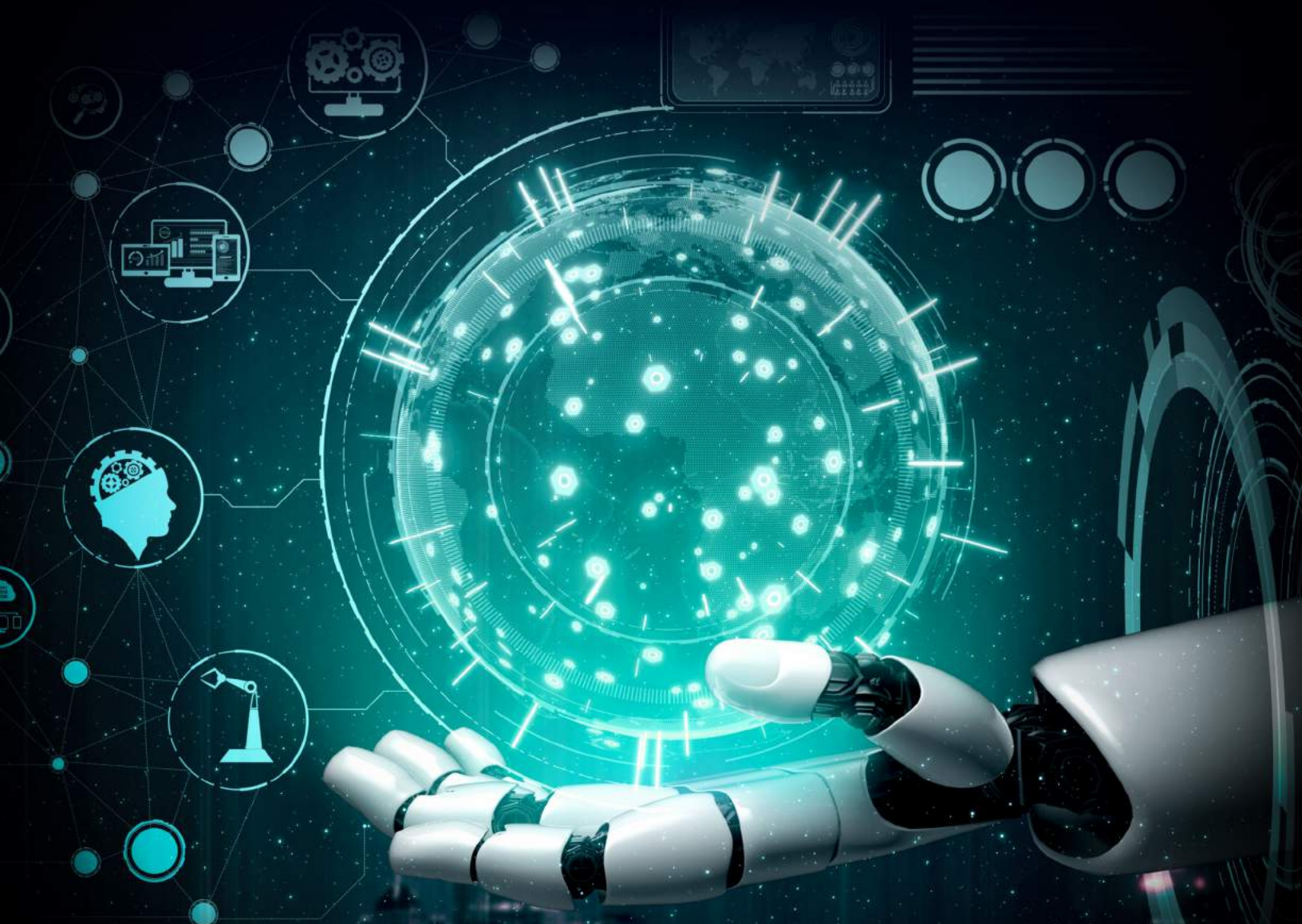# Using Low-code Solutions to Make the Most of Industrial IoT

The industrial Internet of Things (IIoT) has opened unprecedented opportunities for businesses to automate complex processes, integrate physical systems with digital controls, and leverage AI to optimize operations.

Yet, industrial IoT devices on their own constitute only part of the equation that unlocks these innovations. Equally important is having in place software solutions that allow businesses to take full advantage of the data collection, analytics, and automation features that IoT devices offer.

That's why implementing an efficient, flexible software development solution should be a core part of any industrial IoT strategy. Organizations need a way to create customized applications that support their unique IoT-centered use cases. They must also ensure that multiple stakeholders can collaborate seamlessly on the design of those applications. And from a technical perspective, they need a simple and smooth means of deploying their IoT applications, then updating them on an ongoing basis to ensure they remain in alignment with evolving business requirements.

These goals are difficult to achieve using conventional approaches to software development, which center on having professional developers write extensive volumes of code from scratch. Not only is conventional development too slow to accommodate rapidly changing business needs, but it also makes it difficult for stakeholders from across the business to ensure that their needs are reflected in application deployments.

A low-code approach to industrial IoT development

Businesses can resolve these challenges by adopting a low-code development strategy. With a low-code approach, organizations can create custom applications for IoT use cases and maximize the number of data sources they leverage to help manage processes. They can also more easily align applications with the needs of multiple business stakeholders while also speeding and simplifying application deployments and updates.

Low-code solutions act as the building blocks of an application, saving developers the time they'd usually spend coding from the ground up. As well as giving teams this head start, they often allow apps, features, and processes to be modified (even by less experienced team members) and thus deployed faster.

Low-code development techniques can help businesses take full advantage of IoT devices and networks. It begins by identifying the opportunities that the IoT unlocks for organizations in the industrial sector. Additionally, low-code development helps businesses leverage those opportunities to maximum effect.

In other words, there is an inextricable link between low-code development and industrial IoT. While it may be possible to leverage the IoT without low-code development, businesses that do so miss out on a critical competitive advantage: The opportunity to customize analytics quickly and fully to meet specific and fast-changing business needs.

There are additional benefits of using low-code development methodologies. Low-code technology allows team members to build solutions relatively easily, i.e., without in-depth knowledge of coding languages, best practices, and development concepts. Developers are presented with a basic, drag-and-drop framework that gets solutions up and running quickly, sometimes in a matter of hours.

Low code enables citizen developers to get solutions on the board without waiting for IT. It doesn't replace IT completely – enterprises still need IT for higher-order tasks such as governance, data ingestion, and cybersecurity – but it allows business departments to partner with IT so that customized solutions can be built quickly and still retain all of the requirements from IT.

Specifically, low code allows people working on the floor to create solutions that suit them on their schedule and not based on the priorities of the C-suite or the IT department. Companies using low code can embrace the concept of shadow IT without leaving huge areas of risk open for exploitation. Instead of shutting things down and leaving employees to fend for themselves with hopelessly slow manual processes, teams have the tools they need to create solutions.

The business advantages of industrial IoT

In the industrial sector, the IoT offers businesses the potential to take advantage of several key benefits — provided they have the development abilities in place that are necessary to use IoT devices to their full effect.

Data collection and analytics

Among the core benefits of IoT devices is their ability to collect vast amounts of data from myriad sources. From sensors that monitor manufacturing plant temperature to IoT-connected robots whose locations are tracked as they move around the assembly line, IoT devices can automatically ingest a wide array of data types. In turn, that data can be analyzed to help businesses make split-second decisions and detect operational problems before they lead to major disruptions.

Yet, the ability to collect and process data hinges not just on having physical IoT devices in place at the data source, but also software that can perform the ingestion, aggregation, transformation, and analytics operations necessary to process that data and make decisions based on it.

In this respect, businesses that use low-code development techniques to customize IoT applications in such a way that they work with any and all data sources relevant to their operations are in the best position to leverage IoT devices. In addition, they can quickly implement custom analytics to meet specific business needs.

Without the ability to create purpose-built software in an efficient way, businesses will struggle to find software that supports their unique data collection and analytics requirements. They will also lack the ability to extend data collection and analytics workflows to new data sources as they become available. And they will be highly dependent on specialized data scientists to analyze their data, rather than being able to build custom analytics solutions using the teams they already have in place.

Data aggregation and integration

Relatedly, getting the most value from the data that IoT devices collect requires software that can process and analyze data from individual sources as well as solutions for aggregating and integrating data from multiple sources.

This integration can be difficult to achieve in enterprise environments where data often sits in silos. For example, the shop floor crew may maintain data about the systems it oversees, while data collected by the IT team from software environments is stored separately.

Here again, businesses are in the strongest position to take advantage of all of their data when they can quickly build software for integrating data from across the business, then correlating and analyzing it to gain the most accurate insights into the state of business processes. Otherwise, organizations can only analyze data from individual sources on an individual basis, making it difficult to gain full context and across-the-board visibility into operations.

IT integrations

IoT devices and networks are only one component of a business' full IT landscape. To use IoT data to the greatest effect, businesses must be able to integrate their IoT networks smoothly with other IT systems.

In other words, they must ensure that IoT sensors can connect to services running in the public cloud, for instance, and to line-of-business applications that employees use on a daily basis. Without this integration, the IoT network becomes an island with limited ability to help optimize other facets of the business' IT estate.

Implementing integrations between IoT environments and other IT resources is typically difficult to do if developers have to build each integration from scratch. However, with the help of low-code capabilities, they can take advantage of pre-built integrations that make it much faster and easier to integrate their IoT resources with other IT assets.

Rapid implementation

Enterprise development and IT teams are typically already over-burdened with existing projects. To take advantage of the IoT most effectively, these teams need to implement IoT applications rapidly and efficiently.

With low-code solutions, these teams can quickly implement and update custom IoT software without the rollout becoming yet another task that bogs down overstretched teams even further.

What to expect from a low-code IoT environment

Low code gained great popularity during the pandemic. Businesses realized they need to be more responsive to fast-market changes. While some have wondered if this interest would wane once things return to more normal business operations, the answer is a resounding no. Adoption of low code is expected to grow strongly: Gartner predicts a 23 percent expansion of the low-code market in 2021 alone.

Beyond helping organizations capitalize on the specific IoT opportunities described above, a low-code development strategy paired with IoT infrastructure enables several additional major advantages for developers, IT engineers, and business stakeholders.

Deployment

With low-code solutions in place, organizations can deploy applications in just one click. Just as important, virtually anyone can perform deployments instead of requiring specialized expertise that only certain developers or IT engineers possess.

What's more, because modern low-code development platforms produce applications that are portable and designed to run in cloud-native environments by default, they allow teams to deploy seamlessly to any type of environment. Whether applications will be hosted on-premise, in the public cloud, in a hybrid architecture, or at the edge, low-code solutions enable a smooth deployment process.

Speed

By drastically reducing the amount of custom code that businesses must write to implement new features, as well as providing pre-built integrations, low-code development allows for much faster application development and updates. As John Rhymer, Principal Analyst at Forrester, wrote in an article titled "Why You Need To Know About Low-Code, Even If You're Not Responsible For Software Delivery," low-code platforms can "make software development as much as 10 times faster than traditional methods."

That's a critical advantage, not just when businesses are rolling out IoT software for the first time, but also whenever they need to update it in response to shifting business needs.

Less burden on developers

Low code empowers businesses to do more with fewer developers. It reduces the total time it takes to develop applications and allows businesses to develop highly customized and specialized applications without having to find and recruit professional developers.

For example, AI-assisted development workflows within low-code solutions can help developers construct microflows that are tailored to specific use cases even if developers don't have domain expertise related to those use cases. In addition, drag-and-drop user interfaces and pre-coded snippets allow citizen developers without a formal coding background to implement the functionality they need without drawing on developer resources at all.

Overall, businesses can expect to use up to 70 percent fewer developer resources when they adopt a low-code approach.

Future-proofing

In a low-code development environment, application components such as UI styles and themes are easy to reuse. In addition to streamlining development, reusability also helps ensure that existing software components will remain relevant as applications evolve and as IoT devices themselves change.

In other words, with a low-code approach, businesses don't need to start fresh whenever their applications change, or they implement new IoT hardware. They can reuse much of what they already have in place, keeping their systems compatible even as they evolve.

Faster, more efficient, better-integrated development

In short, a low-code approach to development enables every stakeholder within the organization to build the solutions that he or she needs to get the most from their IoT data. It does so without requiring specialized skills or expertise and without consuming extensive development resources. And it enables development and deployment cycles that are fast and smooth and that integrate seamlessly into the Continuous Integration/Continuous Delivery (CI/CD) workflows and toolsets that many businesses already have in place.

Low-code and IoT go hand-in-hand

To derive the greatest value from IoT solutions in the industrial sector (or, indeed, in any context), businesses require software development solutions that allow them to build customized applications tailored to their unique IoT use cases quickly and efficiently.

It's time to release IT from every mundane development task and create a climate of technology collaboration. Using low code, other business units are empowered to collaborate as equal partners with the IT department to build solutions and rapidly deploy them, creating resilience and flexibility. Teams can pivot on demand without waiting for IT to get to each small project, and IT can oversee the results, especially when these programs deploy company-wide.

Low code puts technology back where it belongs: creating value for the company. As manufacturers adjust to the need for real-time insight and rapid-fire innovation, low code could offer just the compromise they need between development and security.

Siemens has brought the best of both worlds together in an integrated solution of MindSphere® and the MENDIX™ platform. The MindSphere IoT solutions, built on MENDIX, enables businesses to achieve this goal in a way that conventional approaches to development simply can't match. By analyzing and correlating all of the data available to them, substantially reducing the burden placed on professional developers, integrating easily with a variety of other IT services and resources, and allowing for simple deployment into cloud-native environments, applications built on MENDIX, the low-code platform, help businesses thrive in the age of IoT.

RTInsights is an independent, expert-driven web resource for senior business and IT enterprise professionals in vertical industries. We help our readers understand how they can transform their businesses to higher-value outcomes and new business models with AI, real-time analytics, and IoT. We provide clarity and direction amid the often confusing array of approaches and vendor solutions. We provide our partners with a unique combination of services and deep domain expertise to improve their product marketing, lead generation, and thought leadership activity.

SIEMENS

About Siemens Digital Industries Software:
Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing and electronics design meet tomorrow. The Xcelerator portfolio helps companies of all sizes create and leverage digital twins that provide organizations with new insights, opportunities and levels of automation to drive innovation. Siemens Digital Industries Software – Where today meets tomorrow.

A list of relevant Siemens trademarks can be found here. Other trademarks belong to their respective owners.