

# SIEMENS

How low code  
with industrial IoT  
changes the game:  
**The power of  
MindSphere +  
Mendix**



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# Augmenting industrial IoT implementation with low code

The industrial Internet of Things (IoT) is revolutionizing the way manufacturers manage operations, streamline the supply chain, and provide value to customers.

It is estimated that the IoT will generate up to \$11.1 trillion a year in economic value by 2025,<sup>1</sup> making IoT application development a compelling opportunity for a competitive advantage for IoT implementations.

However, making IoT applications is difficult without the right resources. Currently, many organizations face several development challenges. According to a recent survey,<sup>2</sup> developers are in high demand as organizations face a backlog of software projects, and the cost of software development is increasing.

To overcome these issues, forward-looking companies are finding solutions outside of relying on just professional developers. The world of low-code application development is starting to play a major role in IoT application development, enabling companies to push ahead of their competitors with personalized IoT solutions. This powerful combination of industrial IoT augmented with low-code development capabilities helps organizations support innovation, improve IT and OT collaboration, monetize an expanding customer and supply chain ecosystem, extend the capabilities of legacy systems, and much more.

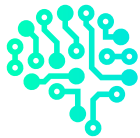
This ebook takes a look at how companies using the industrial IoT can augment their implementation through low-code development. Specifically, it explores using the integrated capabilities of MindSphere®, Siemens' industrial IoT as a service solution, with Mendix™, the low-code application development platform.



# IoT app development challenges

While building personalized apps for specific business use cases can provide great advantages, it can be extremely hard to do without the right tools and services.

Two common challenges include:



## Domain knowledge

Developing IoT applications often involves multiple disparate technologies and requires a broad domain knowledge across IT and OT systems (systems that often do not talk to each other). Further, developers need to really understand how users interact with machines and the insights that need to be uncovered.



## IT and OT elements

Building IoT applications with traditional development techniques requires specialized skills, which are in high demand today. The industrial IoT is typically comprised of a complex mix of endpoints, platforms, back-end systems and data—including sensors, actuators, processors, embedded software, middleware, apps, analytics and machine learning. Developers must not only be versed in their organization's OT systems and its underlying data and services, but also understand the IT elements.

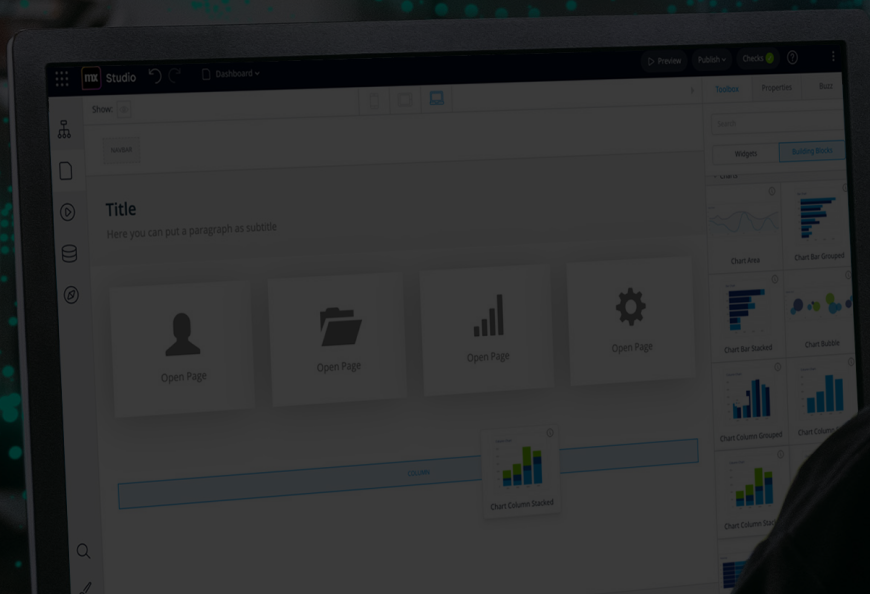


# Together, MindSphere and Mendix alleviate IoT application development challenges

The Mendix all-in-one low-code platform is the fastest and easiest way to build applications for industrial IoT. The visual, model-driven approach enables professional developers, as well as non-developers and domain experts, to create IoT applications specific to their needs. Professional developers have access to the full-code, while citizen developers use an AI-assisted, model-based, visual interface.

Here are five key advantages of using MindSphere and Mendix to improve the value of your industrial IoT implementation:

- 1 Empower your people
- 2 Improve IT and OT interconnectivity
- 3 Expand your application ecosystem
- 4 Connect data sources and extend current solutions
- 5 Personalize IoT solutions



## 1 Empower your people

Your domain experts know what analytics or applications they need to get their job done the most efficiently. However, they often are unable to get what they need developed by IT, who typically has a constant backlog that is several months long. MindSphere and Mendix changes the game. Because Mendix has a clean integration with MindSphere, citizen developers are empowered to improve workflows and processes by creating their own IoT applications - even when they have no coding experience.

The Mendix user interface makes it fast and easy for non-developers to create industrial IoT applications using a low-code approach. And that's not all. Mendix also provides users access to MindSphere APIs, reducing reliance on IT and OT experts to create the connecting paths. Business users can create MindSphere applications on their own, and then, once the heavy lifting is done, collaborate with IT on governance.



## 2 Improve IT and OT interconnectivity

IoT environments are often siloed from other systems, but MindSphere and Mendix make it possible for IT and OT systems to communicate with each other and with external systems, such as ERPs, CRMs, SAPs and more. MindSphere features built-in connectors (made using Mendix) that enable IoT systems to bidirectionally share data with other enterprise systems and facilitate faster alignment.

With connectors in place, newly developed Mendix apps can analyze IoT data with data from other systems. This combined analysis allows for more actionable insights, improved customer experiences and streamlined operations.



### 3 Expand your application ecosystem

Low-code development empowers you to share, build and sell applications that benefit your company, partners and suppliers. Mendix helps designers and developers build a broad range of multi-experience applications – web, mobile, immersive and conversational UIs – using IoT data from MindSphere and other enterprise systems.

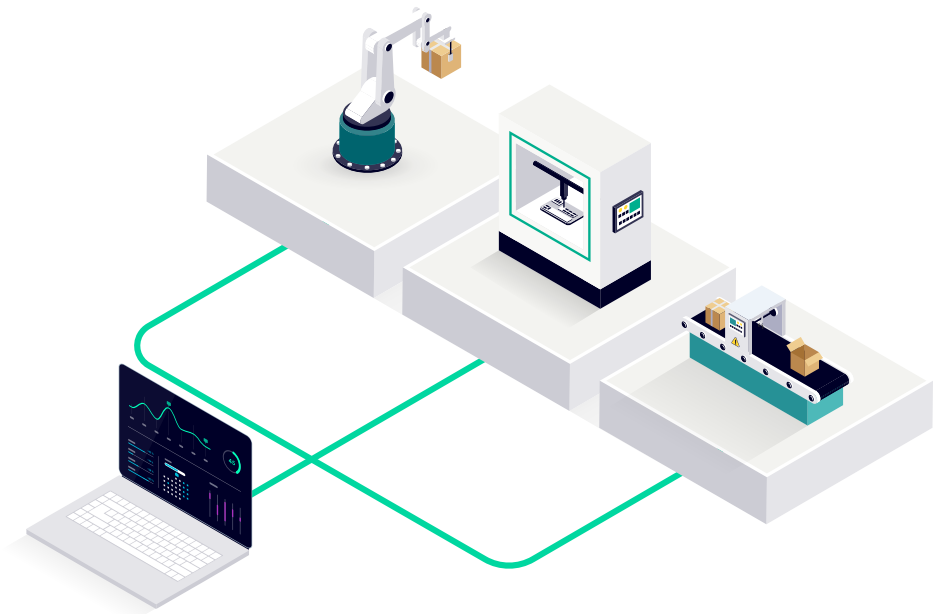
These applications can streamline processes with your suppliers and partners, or can be sold to your customers as new services. You can use these apps to create closer, more efficient relationships with your entire business ecosystem.



### 4 Connect data sources and extend current solutions

Mendix helps integrate your IoT data with other data from legacy tools or systems by facilitating the connection of critical data sources. With connections in place, Mendix provides robust data cataloging that creates relationships across multiple systems, enabling you to create new applications or to augment an existing one. With the ability to update and modify existing applications, users can address advanced use cases their solutions previously couldn't handle.

Furthermore, all output from Mendix is contained as a self-packaged application, meaning it can be used and adapted within any cloud hyperscaler.



## 5 Personalize IoT solutions

The most prominent benefit of low-code development with an industrial IoT implementation, is that domain experts can make the applications they need to make their output more efficient and lucrative. Personalized applications allow users to automate data collection in the field and analyze it to get the insights they need.

As previously mentioned, Mendix offers multi-experience functionality, enabling users to create native iOS and Android apps from a single code base while reusing the same model and application logic as existing web applications. Mobile apps can even feature different capabilities that customers and employees require, including offline functionality, push notifications, GPS and NFC barcode scanning.



# Get the most out of your IoT investment

Industrial IoT implementations are becoming more and more common in every industry, as it's becoming a necessity for maintaining future success. However, it is not the end-all solution. Savvy companies are finding new ways to make their industrial IoT journey more adaptable to their needs through low-code development. Customizing and personalizing their IoT solutions provides a quicker and more assured path to ROI.

Mendix and MindSphere seamlessly work together to enable organizations to customize their industrial IoT solutions; getting people the right information and insights at the right time.

The rich integration of MindSphere and Mendix empowers users of all skill levels to rapidly develop the IoT applications needed to get the right data at the right time, in order to make the right decisions.

**[Get a free MindSphere account and learn how the IoT can work for you, as well as experience how Mendix integrates with MindSphere.](#)**



## About Siemens Digital Industries Software

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<sup>1</sup>McKinsey, How can we recognize the real power of the Internet of Things?

<sup>2</sup>Mendix, The State of Low-Code 2021: A Look Back, the Light Ahead