IXON

Make, Buy, or Hybrid?

6 things to consider when implementing an IIoT platform

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When machine builders want to implement an Industrial IoT platform, they face the decision of whether to "Make", "Buy" or take the middle way: "Hybrid". This article explores the benefits, challenges and considerations of each approach to help machine builders navigate to the best choice for them.

Why machine builders need an Industrial IoT platform

Industrial IoT platforms (IIoT platforms) play a crucial role for machine builders. These platforms empower them to deliver more efficient and reliable machines and unlock new business opportunities. In addition, IIoT solutions enable remote monitoring, diagnostics and troubleshooting while offering data-driven insights. This helps machine builders to improve machine performance, enhance future designs and to offer value-added services.

The Make or Buy challenge

Machine builders looking to use an Industrial IoT platform are often left with the question: should we **buy** an off-the-shelf solution, **make** a custom one or choose a combination of the two: **hybrid?**

There's no one-size-fits-all answer to this question. To answer this question for yourself, you need to weigh the 6 factors on the right.

In this paper we will guide you through these 6 topics and make a comparison between **Make, Buy and Hybrid** to help you make the right decision for your business.

1 Customization

2 Time to market

3 Technical expertise

4 Investment

5 Security risks

6 Scalability

3 approaches to IoT platforms: Make, Buy & Hybrid

Before we cover the 6 topics, we will first elaborate on the **3 approaches.** Each approach offers pros and cons, allowing machine builders to choose the option that best aligns with their resources, expertise, and strategic objectives.

Make

With the 'Make' approach, one builds the IIoT solution from the ground up, using the machine builder's own resources, skills and infrastructure or with the help of a third party. This allows for extensive customization and control.

Preferred approach in the building sector, automotive, retail, process and energy and utilities industries[1].

Buy

With the 'Buy' approach, the machine builder purchases the entire IIoT solution from an external supplier. This way, machine builders get an off-the-shelf solution that is fully developed and ready for instant deployment.

Preferred approach for pharma, but low adoption in building, retail and electronics industries[1].

Hybrid

With the 'Hybrid' approach, machine builders buy a pre-built IoT platform from a software vendor, but have the flexibility to customize and integrate with third-party tools. They can do this themselves or with the help of the supplier or their partner network.

Preferred approach in most sectors, especially electronics and machinery and the exception of the building sector[1].

Comparison: Customization

To achieve the most value out of the IIoT solution, it needs to be fully adapted to the machine builder's (and his customers') use cases and requirements. How does the level of customization differ between Make, Buy and Hybrid? What can be customized and is it possible to adjust the platform to the machine builder's business needs?

Make

Machine builders can **customize every aspect** of the IIoT platform to meet their needs. They can develop the platform from scratch, allowing maximum flexibility in terms of features, integrations and user interface to suit their specific requirements and operational demands so it fits seamlessly into their existing workflows and machines. Moreover, machine builders can scale the platform over time and adapt it to new requirements.

Buy

Machine builders only have limited options to customize the functionalities or integrations of the pre-built IIoT platform. The platform comes as a standardized solution with fixed capabilities and configurations, leaving **little room for customization** for specific needs. Scalability can also be limited because the architecture and capabilities of the platform are fixed in advance and can't be easily modified.

Hybrid

The 'Hybrid' approach gives machine builders the freedom to **customize most of the solution,** such as user interfaces, features and integrations, while using a standardized platform making it scalable. In addition, it provides flexibility to integrate applications the machine builder previously invested in. The platform vendor can help with integrating and developing additional applications.

Use case: From Buy to Hybrid

A machine builder specializing in custom-built CNC machines initially chose a pre-built IIoT platform (Buy) to quickly implement remote monitoring capabilities for their customers. The platform provided standard visualization tools and basic data analytics. After deployment, they realized that the pre-built platform **lacked the flexibility to integrate** specific customer requirements and advanced analytics they needed to differentiate in the market. Therefore they decided to switch to a Hybrid IIoT platform, where they retained the core functionalities of the pre-built platform but **developed custom modules and integrations** to meet their specific requirements.

Comparison: Time to market

A fast time to market is important for machine builders because the industry is rapidly evolving. An IoT platform allows them to gain a competitive advantage and to meet customer demands. How does the decision to Make, Buy or Hybrid affect the time it takes to bring a product or solution to market?

Make

Typically, the Make option has the **longest project timeline,** from kickoff to rollout. Machine builders that want to 'Make' their own IoT platform need large funds, which often takes a long time to collect. Embarking on development without a clear vision and continually expanding the scope creep are common pitfalls in 'Make' IoT projects, often leading to high costs and delays. In addition, iterations and quality testing also take a lot of time.

Buy

The time required to bring an off-the-shelf IIoT platform to market is **typically shorter.** The solution is already developed, tested and ready to use. The implementation time is also short since the solution (only) needs to be adapted to the organization's equipment.

Hybrid

The time to market for an IIoT platform using the 'Hybrid' approach **varies based on desired customization and integration.** It provides a balance between the speed of implementation associated with buying an off-the-shelf solution and the flexibility of customization with a 'Make' approach.

Use case: From Make to Hybrid

A manufacturer of agricultural equipment initially built their own IIoT platform (Make) for advanced data visualization and predictive maintenance. The project took over a year with 2 FTE dedicated to the project, much longer than expected. As a result, they had to **delay the market introduction** and lost a number of sales opportunities. To avoid further delays in the project, they decided to switch from Make to a Hybrid approach. They purchased licenses for a commercial IIoT platform to handle core functionalities and development of custom modules. This Hybrid approach allowed them to launch the solution **in less than 3 months,** improving their time to market and enabling quicker customer adoption.

Comparison: Technical expertise

To deliver an IIoT solution, you need the right expertise (in-house) to decide on the technical requirements, integrate with the existing IT infrastructure, and keep the solution operational. The question is what level of technical expertise is needed. This varies for the 'Make', 'Buy' and 'Hybrid' approach.

Can it be outsourced to the platform vendor or does the machine builder need a dedicated team? This is where the skill gap as an operational challenge comes into play. It's also important to take into account the transferability of information to new employees.

Make

Overall, the level of technical expertise required is extensive and spans multiple disciplines, including software development, programming, data analytics, cybersecurity, hardware integration and project management. Machine builders either need a **skilled team with the necessary expertise** to tackle the complexities of developing an IIoT platform in-house or a reliable partner that can support them. It's important to document everything, since a custom IoT solution makes it hard to transfer information when the developers leave the company.

Buy

A 'Buy' approach needs less in-house technical expertise since machine builders are acquiring a pre-built IIoT platform from a third party vendor. The platform vendor has developers that will offer continued support and updates for the solution. This means that the machine builder **doesn't need to have their own team** for this purpose. However, some level of technical expertise is still required to effectively evaluate, implement, integrate and operate the purchased solution within the existing systems landscape. 'Buy' solutions are relatively easy to transfer, since everything is in the hands of the platform vendor.

Hybrid

The level of technical expertise needed is typically moderate. While machine builders start with a pre-built IIoT platform from a third-party vendor, they still need skilled employees with expertise in evaluating, customizing, integrating, deploying, and supporting the purchased IIoT platform to ensure successful implementation and operation within their organization.

However, in most cases, there is no need for a dedicated team and **some employees can work on it part-time.** It's quite easy to transfer information since the platform vendor is aware and responsible for the biggest part of development. and responsible for the biggest part of development.

Use case: From Make to Buy

A machine builder of pallet wrapping machines offers wrappers in a Pay-per-Use model, whereby an invoice should be sent to customers automatically. They first did this with their own IIoT platform (Make), but eventually decided to outsource this in a Buy solution because they did **not have enough technical expertise** to do this themselves. They chose to buy a commercial IIoT platform with robust support and features. This **reduced the technical burden,** improved reliability and availability, and ensured faster implementation, allowing the machine builder to focus on their core competencies instead.

Comparison: Investment

Whatever approach you choose to implement and operate an IIoT solution, it will require investments both in time and money. What levels of investment are needed when choosing a 'Make', 'Buy' or 'Hybrid' approach?

Make

The decision to make an own IoT solution comes with **significant upfront costs but also recurring costs** to keep the solution up-and-running. Think of investments in finding and hiring skilled employees, additional equipment, software licenses and development tools. And it is no exception to the rule that there often will also be unexpected costs.

A Microsoft study shows that 20% of machine builders that chose a 'Make' approach reported budget constraints[1]. It also requires time to design, develop, test and iterate the IIoT platform and once it's deployed, ongoing maintenance and technical support is needed to ensure proper reliability, security and performance.

Buy

The 'Buy' approach involves **low upfront development costs,** but machine builders still need to **budget for expenses** related to licensing, implementation, training, support and ongoing maintenance. It's essential for machine builders to carefully evaluate these costs and consider the total cost of ownership over the lifetime of the IIoT platform.

However, the same study shows 3% of machine builders reported budget constraints[1] with a Buy approach, which means that, with limited budget and resources, they can benefit from an off-the-shelf IoT platform.

Hybrid

The 'Hybrid' approach offers a balance between the 'Make' and 'Buy' approach. Machine builders still need to budget for expenses related to licensing, implementation, training, support and customization.

However, the costs associated with this approach **depend on the extent of customization and integration required,** as well as the level of support and services provided by the vendor. With this approach, according to the same study, 11% of machine builders experienced budget constraints[1].

Use case: From Make to Buy

A manufacturer of industrial robotic systems built their own IIoT platform (Make) for monitoring and managing robotic arms in different factories with the idea it would be a one-time investment with long-term savings. However, **development costs quickly escalated** beyond their initial budget due to constant need for updates and the need for skilled employees to maintain the system. The total cost of ownership (TCO) turned out to be significantly higher than expected. They switched to a Buy approach and chose an IIoT platform with a **subscription model.** This reduced their upfront investment and allowed them to dedicate their resources to other projects. Updates and support were part of the subscription fee.

Comparison: Security risks

Cybersecurity is an increasingly important topic. Especially the manufacturing industry is prone to ransomware attacks due to the frequent use of older equipment and technologies, and the high cost of a business stand-still. What are the risks associated with the 'Make', 'Buy' and 'Hybrid' approach in terms of security? Is it possible to maintain a solution which is compliant with current and future regulations and standards?

As more technologies integrate into production lines and industrial processes, the attack surface also increases. Combined with the increased need of cloud connectivity for e.g. predictive maintenance, real-time analytics and remote performance monitoring, the need for highly secure IIoT platforms is evident.

Make

Building an IIoT platform from scratch introduces cybersecurity risks. Without proper expertise and resources, the platform may be vulnerable to security breaches. It's often hard for machine builders to maintain security themselves, because **you have to constantly stay on top of it.** 10% of machine builders that chose the Make approach reported that they weren't able to tackle cyber threats[1]. Another challenge they run into is that getting certified for security standards is costly.

Buy

The security of the purchased IIoT platform depends on the security measures implemented by the vendor. Security updates are **performed by the platform vendor** if you have a support contract. However, if they don't prioritize security or fail to follow best practices, the platform may be vulnerable to cyber threats. 20% of machine builders weren't able to tackle cyber threats with the off-the-shelf IoT platform they chose[1].

Hybrid

With the 'Hybrid' approach, machine builders should carefully assess the security practices and track record of IIoT platform vendors, considering factors such as security certifications, compliance with industry standards, incident response capabilities, and commitment to security updates and patches. Machine builders **share security responsibility with the platform vendor,** who secures the platform while the machine builder secures the data, endpoints and access controls. Interestingly, only 4% of the machine builders who chose this approach were unable to tackle a cyber threat[1].

Use case: From Buy to Make

A large machine builder, active in the defense sector, initially used a pre-built IIoT platform (Buy) to manage their manufacturing processes. However, concerns about the security of sensitive data increased and the need for compliance with military-grade standards became critical. As the **reliance on a vendor's security protocols** posed a potential risk, they developed their own custom IIoT platform (Make). By building the platform in-house with a dedicated team, they implemented specialized security measures, ensured full **control over their data,** and significantly enhanced their security posture.

Comparison: Scalability

Initial adoption of a (new) IIoT solution will be modest, but over time it's likely to grow in terms of number of customers, devices and data used. How does the level of scalability differ between Make, Buy and Hybrid? How scalable is it in terms of users, data volumes and devices, and is it possible for the platform to scale with the machine builder's future ambitions while maintaining reliability and availability?

Make

With a 'Make' approach, machine builders can scale the platform over time and **adapt it to new requirements,** provided it's built on a scalable architecture and data infrastructure. They can add new devices and users as the business grows and optimize the platform for specific types of data or workloads. However, it's also important to keep the platform reliable and available with a team of experts.

Buy

Scalability can be limited in case the architecture and capabilities of the platform are fixed in advance and can't be easily modified. Though, many commercial IoT platforms are **designed to handle large-scale organizations.** In most cases the platform vendor provides continuous updates and ensures the reliability and availability of the platform. The risk here is that updates might not always align with the timeline and needs of the machine builder.

Hybrid

Here the same applies as with the 'Buy' approach, although generally speaking machine builders have more influence on the level of scalability of the solution by introducing specific services for e.g. data handling purposes. Customizations made can **scale along with the updates of the platform vendor.** Depending on the nature (and layer within the architecture) of the customizations, adaptations can have a smaller or larger impact on the overall scalability of the IoT solution.

Use case: From Make to Hybrid

An European machine builder built their own IIoT platform (Make) to monitor equipment performance and optimize operations in large farming operations. The initial system worked well for small deployments. As their business grew, the platform **struggled to scale efficiently.** The custom-built system required significant modifications to handle increasing data volumes and additional devices, leading to performance bottlenecks and reliability issues. They transitioned to a Hybrid approach, **integrating scalable commercial cloud services** to handle data processing and storage while retaining custom-built features for device management and control. This allowed them to scale their operations more effectively and handle larger deployments without sacrificing performance.

Decision-making criteria

What criteria should machine builders use to evaluate which approach is most suitable for them? Although there isn't a one-size-fits-all solution, machine builders should thoroughly consider which approach aligns most effectively with their needs, budget and resources.

Answering the following questions can help machine builders to better understand which approach suits them best.

Customization

- What custom features should the IIoT solution include (both now and in the future)?

- What would you like to customize? (e.g. user interface, dashboards)

- Would you like to integrate with 3rd party applications? Which ones?

- How critical is the ability to tailor the platform to your own business processes and workflows?

Time to market

- How urgently do you need to deploy the IIoT platform to stay competitive or meet business objectives?

- How will delays in deployment impact your business operations?

- Do you have a clear business case and a clear view on what you need the IIoT platform for?

Technical expertise

- How many FTEs are available for developing, maintaining, updating and troubleshooting the IIoT platform?

- Do you have access to the specific technical skills that are needed for the desired approach internally or through partnerships?

- What training and support will be required for your team to effectively manage and use the IIoT platform?

Investment

- What is your budget for developing, deploying, and maintaining an IIoT platform?

- What is your budget for recurring costs?

- What is your budget for hiring skilled employees, equipment, software licenses and development tools?

- How will funding for the IIoT platform affect other areas of your business?

Security risks

- What are the specific security requirements for your IIoT platform?

- How confident are you in your ability to implement robust security measures if you build the platform yourself?

- What is the track record of the vendors you are considering in terms of security breaches and their response to them?

- Do you have a process in place to keep up with the latest security risks, requirements and standards?

Scalability

- What are your projected growth plans, and how will they impact the scalability requirements of your IIoT platform?

- What are your expectations of growing horizontally (adding more devices and users) in the future?

- What are your expectations of growing vertically (increasing processing power) in the future?

- Are there any limitations or additional costs as you grow at the vendors you are considering?

This is a general list of topics to consider when acquiring or developing an IIoT solution. Typically a workshop with experts from both within and outside your organization can be useful to discover additional requirements that are more specific to your own business.

Comparison at a glance

	Make	**Buy**	**Hybrid**
✏️ **Customization**	The entire IIoT platform	No/few customization options needed	Add specific features, integrate with 3rd party apps, add corporate identity and customize dashboards
🕐 **Time to market**	12 - 36 months	2 - 6 months	6 - 18 months
⚙️ **Technical expertise**	Comprehensive expertise in multiple domains is required[2]	Most complex tasks are managed by the platform vendor	Balance required between in-house expertise (moderate technical skills to manage both custom and pre-built components) and vendor capabilities[3]
💲 **Investment**	High	Low	Moderate
🛡️ **Security risks**	Must provide encryption, secure data storage and secure communication protocols. Any gaps can lead to significant security breaches. Also requires continuous monitoring of new security risks and requirements.	Vendor typically provides standard security features. Check if they are sufficient for specific use cases.	Vendor needs to ensure secure APIs, user management, and regular security audits to identify and mitigate risks
↗️ **Scalability**	Requires sophisticated engineering and substantial ongoing investments to scale	Designed to scale from small pilot projects to large industrial deployments (often with licenses)	Designed to scale from small pilot projects to large industrial deployments (often with licenses)

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[1] *Microsoft (July 2023). Digital Operations Signals.- Industrial IoT Solution Spotlight.*

[2] *Losant (April 2020). Should You Buy or Build an IoT Platform? https://www.losant.com/blog/should-you-buy-or-build-an-iot-platform*

[3] *Embedded Computing (2018). Hybrid IoT platforms deliver simplicity, flexibility, and fast time to market for the Internet of Things*
https://embeddedcomputing.com/technology/iot/device-management/hybrid-iot-platforms-deliver-simplicity-flexibility-and-fast-time-to-market-for-the-internet-of-things

Would you like to spar with someone about which approach best suits your business? Or would you like to know what IXON and its partners can offer you?

Our industry experts and technical staff are happy to help, without any obligation.

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