TOSHIBA

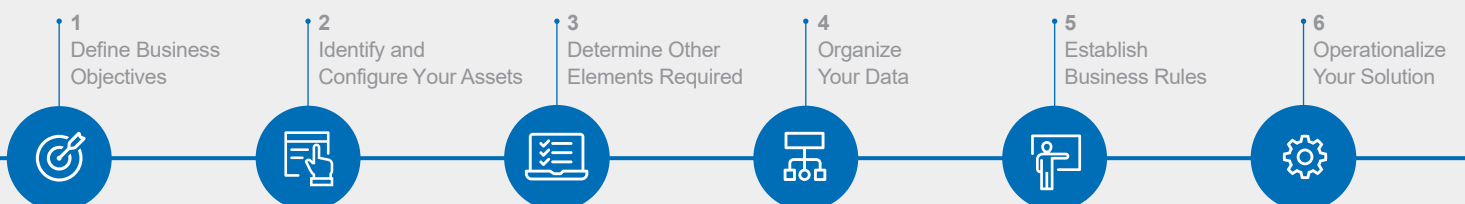# 6 Steps to Remote Monitoring Success

Prepare to visualize your operation and start reaping the benefits of an IoT-based Remote Monitoring Solution.

Connect Your Operation, Transform Your Tomorrow

If you're a manager involved in a process or manufacturing operation, you know that industry is undergoing tremendous changes. Digitization and interconnectivity are transforming facilities by collecting enormous amounts of data generated from devices throughout a facility, delivering near real-time visibility into operations, enabling greater efficiency, faster problem resolution, cost savings and additional valuable insights for developing new processes, products and services.

Remote monitoring is essential as a way to jumpstart this transformation and begin maximizing business value into your operation.

1	2	3	4	5	6
Define Business Objectives	Identify and Configure Your Assets	Determine Other Elements Required	Organize Your Data	Establish Business Rules	Operationalize Your Solution

Your Journey Starts Here

When you're ready to bring the many benefits of remote monitoring to your operation, the following six steps will help ensure your success.

STEP 1

Define Business Objectives

As with any major business initiative, the more clearly you identify the process improvements you want to achieve in your operation, the more likely you'll be able to win broad support within your organization, reach your target and begin to realize a return on your investment.

Your objective or objectives can be anything: improving overall productivity, reducing equipment failure rates or decreasing technician travel time, to name a few. Identifying and visualizing the key performance indicators (KPI) associated with the assets within your operation will greatly help you quantify results by defining and monitoring the desired improvement in those measures.

ID business objectives → **Get buy-in** → **Establish KPIs** → **Quantify success**

Once the business objective(s) have been defined, the next step is to determine the scope of the process you want to remotely monitor. This will most likely require you to examine your entire operation from end to end, reviewing the performance of all assets and identifying how each individual asset contributes to addressing your business objectives. Based on this assessment, you will be able to define the overall scope of your project and plan intelligently.

> *Important questions to ask:*
>
> • *Where are the inefficiencies and what is the growth potential in my operation today?*
>
> • *What are the criteria for a satisfactory remote monitoring ROI?*

STEP 2

Identify and Configure Your Assets

Every operation contains a wide range of different assets, devices and equipment—each responsible for a particular activity in a process. Within the context of this remote monitoring paper, industrial "assets" comprise any element in the process that can generate data when connected to a sensor. Understanding and organizing your assets are fundamental to building an IoT remote monitoring solution that delivers maximum visibility and benefits.

Start by mapping and categorizing your assets, considering:

• Asset type

• Operating system

• Data generated

• Location of asset

• Connectivity
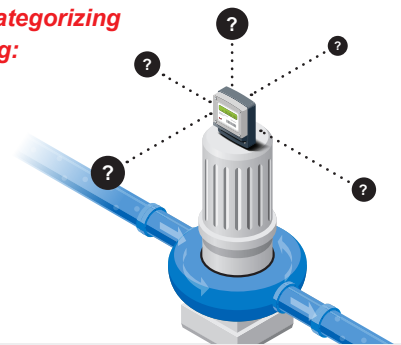
Types of assets

The asset may be a simple device with limited functionality such as a pump, pressure valve or flow meter. It may also be a highly advanced industrial robot capable of multiple complex actions. What is important is to identify and categorize asset types in order to effectively associate those individual assets or asset groups with the specific data that they generate. These asset types can be grouped based on any number of criteria, including common functionality, common location, asset value, etc., according to how you want to visualize and archive the data generated.

Operating systems

In order to create seamless connectivity and data flow throughout your IoT network, you and your implementation team will need to know whether the asset is running Windows®, Linux®, Android® or iOS®, or possibly a proprietary operating system. Note, some so called "dumb" non-computerized assets will have no operating system at all.

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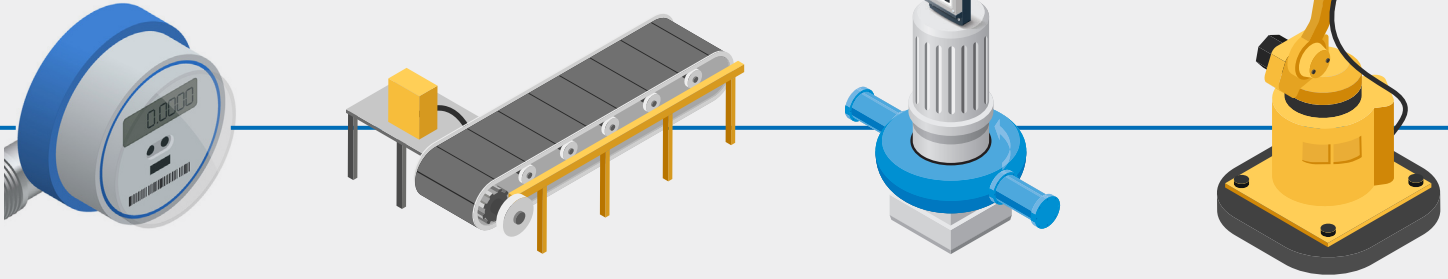
Data

Ultimately, the data generated by your assets are what will determine the value of your remote monitoring solution. Therefore, identifying the essential data points, or key performance indicators (KPIs) an asset or asset group can collect and transmit is a key priority in a successful program. Keep in mind that the asset KPIs should deliver the data necessary to achieve your business objectives.

Location

In addition to individual asset performance data, you'll also want to identify the location and environment where the asset is operating at the site or multiple sites, depending on the scope of the project. This is particularly beneficial for visualizing operations that have parallel processes or multiple geographic locations.

Connection protocols

Determining how assets and the data generated connect to internal systems and cloud or onsite storage is an important step in creating a seamless and effective remote monitoring initiative.

Important questions to ask:

- *What are the key industrial assets or processes we have that need to be monitored?*
- *What kinds of data can be collected and sent?*

STEP 3

Determine Other Elements Required

Asset connectivity through the Internet of Things (IoT) is absolutely essential to remote monitoring. But some assets may be better equipped to connect than others. You may find that you need to add or modify assets in order to acquire the data necessary to achieve your goals.

Some of the assets you identify may already be equipped with sensors to produce a digital signal, while others may need to be upgraded with analog-to-digital sensors. In many cases, particularly with older operations, this will require a physical inventory of devices and equipment to confirm which assets will require upgrading with sensors.

In addition, it is important to consider a smart gateway device or devices capable of integrating and managing the flow of asset data from the edge (physical location of assets) to the cloud.

Legacy hardware	Security needs	Internal systems integration

Because remote monitoring dictates you'll be sending data outside your current network and into the cloud, this is a good time to consider end-to-end security requirements. Make a plan to secure: 1) data on the individual assets, 2) data in transit, and 3) data on the internal systems or cloud services where it will be sent.

At this stage it's also important to consider how the elements of your remote monitoring solution will integrate with your backend systems and business applications. Remote monitoring will generate enormous amounts of valuable data that can be leveraged for a wide range of operational and business benefits.

Important questions to ask:

- *Which of my assets must be retrofitted to connect to the cloud?*
- *How do I extend network security into these assets?*

STEP 4

Organize Your Data

Getting the greatest benefit from remote monitoring involves processing (and gaining visibility into) data from across all your operations in real or nearreal time. That's an incredible amount of data. So, it's very important that you develop complete data profiles for all your industrial assets.

Data types

Different assets generate different types of data, e.g., temperature, fluid level, vibration, etc.

File sizes

Gauging the size of the data files your assets will transmit is key to building a proper infrastructure to handle the throughput and avoid bottlenecks.

Communication frequency

While you'll likely want to monitor the performance of most of your devices continuously and up to the minute, not all your assets will be required to transmit that data in real time. For example, you many want the data transmission frequency for the water level in a tank to be in 5- to 10-minute intervals.

Authorization

It is important at this stage to determine which of your team members will be authorized to access and view particular data sets. This authorization chain of command should be carefully considered for your operation as it will ensure rapid and accurate decision-making for production and emergency events.

> **Important questions to ask:**
> - *Which of my team members needs what data?*
> - *How fast do they need it to derive the most benefit from it?*

STEP 5

Establish Business Rules

You've taken stock of your industrial assets. You've also determined how and by whom your operational data will be used. Now it's time to create rules that will help your team use the remote monitoring solution to achieve your greater business objectives.

The process is as simple as this:

- Identify conditions that will trigger an alert
- Define the actions that should occur next
- Re-examine existing business processes and reprioritize team responsibilities as needed
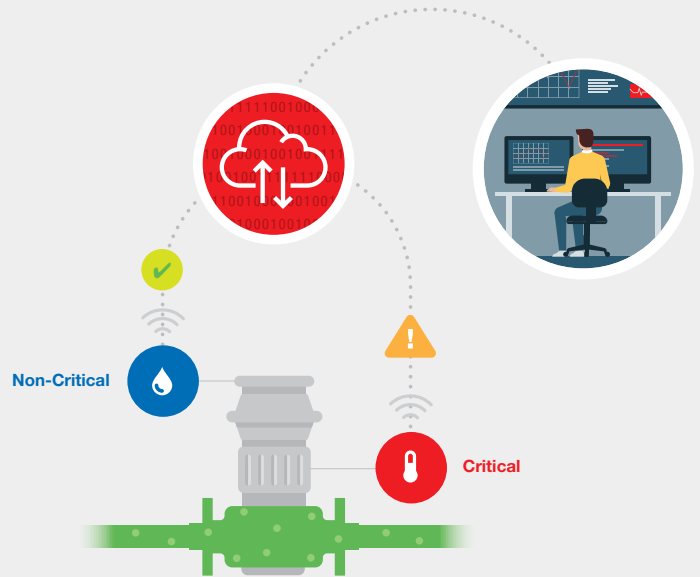
Conditions → Trigger points → Actions → Team responsibilities

You'll need to be very specific about quantitative values here, whether they involve a precise threshold or a range of incremental data points. If you aren't sure, just select a starting point and adjust as you learn more over time.
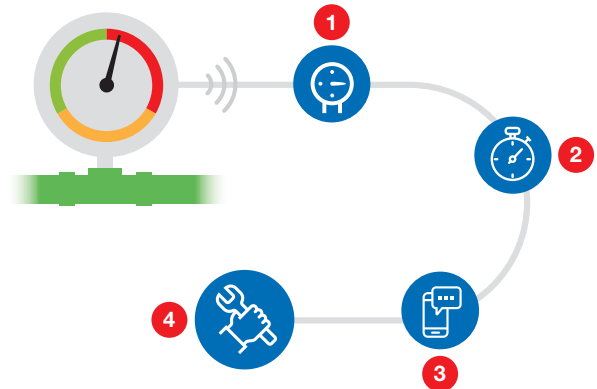
Example:

Pipe pressure is expected to maintain between 2,500 and 3,000 PSI (1), if it varies outside of these thresholds at any time (2), the system should issue a warning and send an alert (3) to a field technician for an immediate action (4).

As you're creating new business rules, this step presents a good opportunity to make adjustments and introduce processes you've been wanting to implement.

> **Important questions to ask:**
> - *What alerts should be triggered when assets reach a certain state?*
> - *What are some of the improvements we've always wanted to make?*

STEP 6

Operationalize Your Solution

After you've completed steps 1-5, you'll be well set to operationalize your remote monitoring initiative by implementing a comprehensive solution.

Begin with a limited pilot program to validate the technology and process changes you've made. Doing so will allow you to refine your business rules and identify potential data gaps before you scale into a facility-wide deployment.

Once fully implemented, your remote monitoring solution will start delivering value immediately by giving you real-time visibility into your overall operation. You'll get insights for improving operational efficiency while also establishing a foundation for realizing improvements in predictive maintenance, capital equipment purchases, facility expansion, simulation modeling and more.

Important questions to ask:

- *How can we scale this solution to involve more of our operation?*
- *What additional value can we capture through more advanced analytics?*

What to Look For in a Remote Monitoring Platform

Taking time to choose the best solution will get you in the game quicker, deliver more immediate benefits and open the door to a much wider, transformative industrial IoT program.

Consider:

- Plug-and-play quick-start capabilities
- Easy scalability
- Starter applications
- Visually intuitive dashboards
- Integration connectors and tools
- Customization without recoding
- Support for a variety of protocols
- Secure data transmission

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