



The Hidden Costs of Delivering IIoT Services

Industrial Monitoring & Heavy Equipment

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EXECUTIVE SUMMARY

We are in the midst of a digital transformation, and the Internet of Things (IoT) is leading the revolution. IDC projects there will be more than 30 billion connected “things” by 2020¹.

Companies are citing “internal productivity and efficiency” as the primary drivers for this momentum toward IoT investments. Yet, running an IoT business can be especially complex for companies in the industrial monitoring and heavy equipment industries. Devices are geographically dispersed with long and complicated supply chains. This can introduce unique challenges:

- **Operations** – It can drain resources to launch, monitor and manage devices into the field.
- **Scalability** – You need an infrastructure that enables you to quickly meet customer demands, operational needs, and expand to new markets.
- **Cost management** – To avoid unexpected costs, you need to monitor data usage in real time, so you can make adjustments before the bill arrives.
- **Customer service** – To ensure service reliability, you’ll need to identify potential issues before they become problems, and ensure a low mean time to repair (MTTR) when problems do occur.

Adding to the complexity, Industrial IoT (IIoT) budgets don’t come from just one group or department within an organization. Although IIoT is seen as a strategic investment, industrial monitoring and heavy equipment industries organizations struggle to create a compelling business case showing a tangible return on investment (ROI).

As you plan your IIoT initiatives, you need a clear understanding of the costs around delivering IIoT services:

- Ongoing operational costs
- Potential revenue from new service offerings
- Operational cost savings
- The time it will take to achieve ROI

This white paper is for business leaders charged with the overall management of IIoT initiatives and those with operational and financial responsibility who seek a better understanding of the total costs associated with IIoT services. It is designed to assist you in developing a business case that goes beyond IIoT service deployment to operational scalability and long-term business growth.

¹ IDC “Worldwide Internet of Things Forecast, 2015-2020,” May 2015.

UNDERSTANDING OPERATIONAL EXPENSES (OpEx) FOR IIoT



Network communication

33-50 percent

- Monthly/device subscription fee
- Monthly/device overage fee



Administrative labor

20-50 percent

- Every deployed device requires at least 15 interactions/year
- Each interaction takes at least 5 minutes



Technical support

10-33 percent

- 10% of deployed devices require support
- T1 MTTR: 25 minutes
- T2 MTTR: 3 to 5 hours



Time to market

- Time to provision devices and services
- Testing devices and services before deployment

Mobile network operator costs
+ administrative labor costs
+ technical support costs
= OpEx costs

DEFINING OPERATIONAL EXPENSES

Understanding the OpEx costs can help IIoT leaders like you make smart decisions about the technology and processes you need to ensure that your IIoT initiatives run at the lowest cost, highest availability and provide the best customer experience.

First, let's define the categories of costs incurred in running a connected service business.

- **Network communication:** The costs associated with connecting devices to the Internet, most often via wireless sensor networks, radio frequency identification (RFID), Wi-Fi or a mobile network.
- **Administrative labor:** The ongoing costs associated with the day-to-day management and operation of IIoT assets and business processes.
- **Technical support:** The costs associated with identifying, troubleshooting and resolving field-reported issues with the IIoT assets.

In addition to these hard costs, you also need to consider the OpEx areas that can impact your time to market:

- How quickly can you roll out new devices and services?
- How quickly can you generate revenue from those devices and services?

In the following sections, we'll review each of these costs in greater depth.



NETWORK COMMUNICATION COSTS

Connecting devices to the Internet is the linchpin of IIoT. However, connecting all of your end devices, wherever they may be, poses a significant challenge and is dependent on multiple requirements including technical, security, performance, reliability, and location.



There are many options when choosing connectivity. Today, many companies are moving to mobile networks (or cellular) to give them better control over the IIoT experience². Given the growing adoption of mobile network connectivity, we focus on mobile networks as the primary channel for network communication in this white paper.

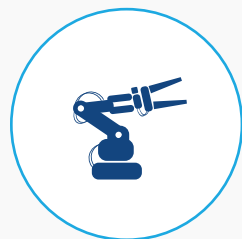


In terms of ongoing costs for IIoT initiatives, payments to your mobile network operator (MNO) typically account for 33-50 percent of the overall OpEx spend³. There are eight factors that can impact your total ongoing operational costs. Each have unique characteristics that are important to understand when building your business plan:



1. **Monthly access fees:** IIoT service plans typically have a monthly access fee for connecting to the mobile network, and this charge is often independent of the fees incurred for data usage. Keep monthly access fees in mind if the lifecycle of your IIoT service includes periods of non-connectivity.
2. **Data plans:** Fees for IIoT deployments are typically either pay-per-use, where you pay per kilobyte, megabyte, or gigabyte, or per-device; and you typically subscribe to a fixed amount of data per month. Depending on the use case, some IIoT applications average as little as 25 kilobytes per month, while others can be as much as 1GB per month. Consider that typical IIoT applications use significantly less data per month than consumer phones or tablets. Paying per MB may be the most cost effective, especially if the monthly usage fluctuates. For some companies with devices that have higher data usage, per-device plans with pooling could be the most cost effective, especially if the monthly usage is consistent.

AVERAGE ANNUAL MOBILE NETWORK OPERATOR SPEND FOR 100K DEVICES⁴



Industrial Monitoring and Heavy Equipment

\$1.25/device/month

- Average Data: 2MB/device/month
- Average SMS: 19KB/device/month

²Alleven, Monica. "AT&T identifies 'cellular-first' trend in Internet of Things." FierceWirelessTech. Fierce Markets, 16 November 2015.

³⁻⁴Based on data analysis of more than 3,500 companies worldwide across 20+ different verticals that use Cisco Jasper to manage their connected devices.

3. **Overages:** It can be difficult to estimate the amount of data required for your services, especially if they're relatively new. Some MNOs offer flexible rate plans that allow you to change your plan in the middle of the billing cycle. There are certain plans that let you pool data usage across a large number of devices, which in some cases can help you control your rates. If available, both of these options could help you avoid unexpected and costly overage charges.
4. **Roaming:** If your devices will be on the move, consider whether they will be used outside their primary coverage area. If so, there are usually additional charges for roaming, which vary by country and zone.
5. **Rounding:** Some MNOs limit the amount of time that a device can be connected to their network. A session typically lasts four hours before the device is disconnected to free up resources for other devices on the network. When the four-hour session ends, usage is generally rounded up one KB. Rounding charges may not seem that significant, but over time, rounding can add up if you're deploying thousands or tens of thousands of devices. Additionally, some MNOs round up considerably more when calculating roaming sessions.
6. **Taxes and surcharges:** Some MNOs, which are governed by country-specific regulatory bodies, are required to charge more taxes than non-regulated MNOs. Although these costs may vary, the MNO should be able to give an estimate of the charges.

TOP TIP

To best manage network communications costs:

- Partner with experienced IoT providers
- Monitor real-time usage
- Align usage with optimal rate plan





ADMINISTRATIVE LABOR COSTS

IloT services enable companies to drive continuous customer engagement, gain real-time product insights, and tap into new revenue streams. Planning appropriate staff and labor spend is key to achieving this.

Administrative labor includes the costs associated with the tasks of managing a connected device, such as provisioning, monitoring, generating reports and deactivating or retiring. The cost of administrative labor is proportional to the scale of your IloT deployment, the complexity of your device lifecycle, the number of devices deployed, and the supporting infrastructure.

Companies new to IloT need to cost effectively and quickly get IloT services up and running, efficiently manage operations, and keep costs in check to ensure a successful business model.

Quickly launch new services

Devices exist in different states at different stages of use: activated, deactivated, retired, in testing mode, etc. Each state determines the device's ability to establish data connectivity on a network and determines whether the device is in a billable state or not.

When launching new connected devices, you will need headcount to map policies, permissions, behavior, usage and rate plans to the different states.

Streamline and manage operations

Once connected devices are deployed, you will need personnel to constantly monitor changing network conditions, device usage patterns, and behavior to ensure the highest service reliability. You must also be able to quickly and cost-effectively identify and diagnose issues.

You will need to establish internal standards for how you expect the devices and services to behave. Defining these standards will enable you to control the behavior in real time, and immediately identify and respond to rogue device behavior.

TOP TIP

An IoT service platform enables you to optimize your administrative labor and focus talent on key functions.



Keeps costs in check

IIoT services can be a source of new and recurring revenue. However, if usage and rate plans aren't rigorously managed, unexpected costs can quickly erode margins and cut profits.

You will need additional personnel to track real-time usage and rate plan data to ensure that your devices are running at the lowest possible cost and the highest possible efficiency.

IoT service platform

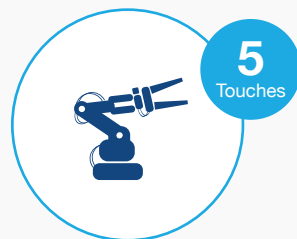
For many companies, administrative labor around the IIoT service lifecycle will account for 20-50 percent of overall OpEx costs. The costs vary depending on the IT management infrastructure in place, the number of devices being managed, the device lifecycle and geographic areas of deployment.

IIoT solution providers are emerging to address these growing needs. As companies evolve their connected devices and the services they deliver, an IoT service platform automates many of these processes and provides real-time visibility. Additionally, an IoT service platform can uncover / deliver insights that drive more effective business decisions, innovate business models and increase operational efficiencies.

AVERAGE ANNUAL ADMINISTRATIVE COSTS FOR 100K DEVICES⁵

Assumptions:

- Average hourly salary for professional operations administrator in the United States is \$48 per hour.
- Each time personnel touch or fetch data from a single device, it will require 5 minutes of labor.
- Industrial monitoring and heavy equipment companies will touch each device 5 times per year.
- With the right IoT service platform can you reduce your touches to 2 per year.



Industrial Monitoring and Heavy Equipment

Without platform:
\$2.0M

With platform:
\$800K

⁵Based on data analysis of more than 3,500 companies worldwide across 20+ different verticals that use Cisco Jasper to manage their connected devices.



TECHNICAL SUPPORT COSTS

Manually supporting IIoT services is not easy. When a problem is reported, a support engineer must first determine the cause: hardware, firmware, the IIoT application, or the connectivity.

There are tens of thousands of different ways that devices and services might connect and interact with one another. That complexity creates countless, unpredictable service points that represent a complicated technical headache for end users.

Technical issues and their associated costs vary across industries depending on the number of devices, complexity, and whether the use case for a device is mission critical or not.

For most companies, the cost of labor from their customer support center across Tier 1 and Tier 2 engineers will account for 10-33 percent of their overall OpEx spend.

TOP TIP

At some point your devices will encounter service issues. You must be prepared to quickly identify, address, and fix those situations. Make sure that you have a system and process in place:

- **Identify root cause** of a service issue to reduce response time and get your devices back online faster.
- **Remotely diagnose issues** and suggest possible causes and resolutions to drastically reduce your technical support costs.
- **Align usage** with optimal rate plan.



AVERAGE ANNUAL TECHNICAL SUPPORT COSTS FOR 100K DEVICES⁶

Assumptions:

- 25 percent of your devices will require technical support due to a connectivity-related issue.
- 20 percent of technical support calls will need to be escalated from Tier 1 to Tier 2 support.
- In the United States, the average Tier 1 engineer salary is \$20/hour and the average call lasts 25 minutes.
- In the United States, the average Tier 2 engineer salary is \$40/hour and the mean time to resolution (MTTR) is 4 hours.



Industrial Monitoring and Heavy Equipment 25% require technical support

Without platform:

\$1.2M

- \$208K for T1
- \$1M for T2

With platform:

\$587K

- \$87.5K for T1
- \$500K for T2

⁶Based on data analysis of more than 3,500 companies worldwide across 20+ different verticals that use Cisco Jasper to manage their connected devices.



TIME TO MARKET

Inefficient and high-cost operational processes will impact time to market and potential revenue opportunity. As you build the business case for IIoT initiatives, consider the following:

- How quickly can you roll out new devices and services?
- How quickly can you generate revenue from those devices and services?



An IoT service platform can help accelerate your time to market. Without an IoT service platform, each IIoT connected device requires an average of 100+ interactions per year. These interactions could be provisioning, rate adjustments, remote diagnostics, etc. With an IoT service platform to automate many of these interactions, you can scale faster and accelerate time to market.



Equally important to getting to market quickly and cost-effectively is ensuring reliability and ongoing performance. Downtime can impact your customer churn rate. With a great customer experience, you could reduce attrition, but with a negative customer experience, you could be at risk of further customer loss.



AVERAGE ANNUAL COST OF LOST REVENUE FOR 100K DEVICES⁷

Assumptions:

8-week delay in launch of IIoT service, which means 16.6K devices not deployed in the field and generating services revenue.



Industrial Monitoring and Heavy Equipment \$332K in revenue loss

- Average service fee of \$10/month/consumer

⁷Based on data analysis of more than 3,500 companies worldwide across 20+ different verticals that use Cisco Jasper to manage their connected devices.

CONCLUSION

IIoT initiatives vary widely, yet the three costs we explored in this white paper are common across geographies: network communications, administrative labor and technical support.

As you consider the long-term health of IIoT services, appropriately anticipating the costs will help you counterbalance the value of increased revenue and new opportunities. With a full understanding of the total cost of delivering an IIoT service, you can make smart, profitable and sustainable business decisions.

Companies of all sizes, across industries, use an IoT service platform to capitalize on IIoT and get the most out of their devices, networks and applications:

- **Accelerate time to market** by easily and rapidly scaling IIoT services across the globe.
- **Gain automated, instant visibility** and control over all of networked devices and services.
- **Ensure higher service reliability** with real-time intelligence and monitoring of changing network conditions.

Cisco Jasper is a global Internet of Things (IoT) platform leader. Cisco Jasper has designed its industry-leading, cloud-based IoT platform to enable companies of all sizes to rapidly and cost-effectively launch, manage and monetize IoT services on a global scale. When companies do this, they become much more than product businesses. They become service businesses, capable of automatically managing their customers' entire IoT service lifecycle, delivering increased customer value and unlocking new sources of revenue.

Thousands of companies in more than 20 industries, including many of the world's top brands, choose Cisco Jasper to fast-track their IoT services. Cisco Jasper partners with 25+ mobile operator groups, representing more than 100+ mobile operator networks worldwide.

Contact Cisco Jasper for more information about how our IoT service platform can enable greater visibility and control over your IoT services.

- Request a demo: jasper.com/demo
- Visit our website: jasper.com
- Speak to a solutions expert: +1 650 810 8000



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