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# 12 tips for successful IoT data management

## Key findings from our IoT data management projects in the automotive industry

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# Content

# Introduction

IoT data retrieved from devices or machines is a valuable source of information. They can tell you a lot about the quality of products and components, how they are being used, and whether customers are happy with their performance. In other words, they can spark further innovation and the development of new services.

The data management service from the Bosch IoT Suite can help you process and then analyze your IoT data. It makes no difference whether the data is retrieved from remote devices or already available in your organization. Using Bosch IoT Insights, you can transform, clean, enrich, and then store your data for further use. It can then be exported in a variety of formats or used to produce reports, visualizations, and rule-based analyses by yourself.

Since 2016, Bosch has run over 42 data management projects with customers primarily from the automotive industry. These projects have yielded valuable insights, which we have summarized below. We are confident they will help you design and run your own IoT data management projects.

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# Why IoT data management?

Why should you be using IoT data from devices or machines? IoT data are a rich source of information that remains largely untapped.

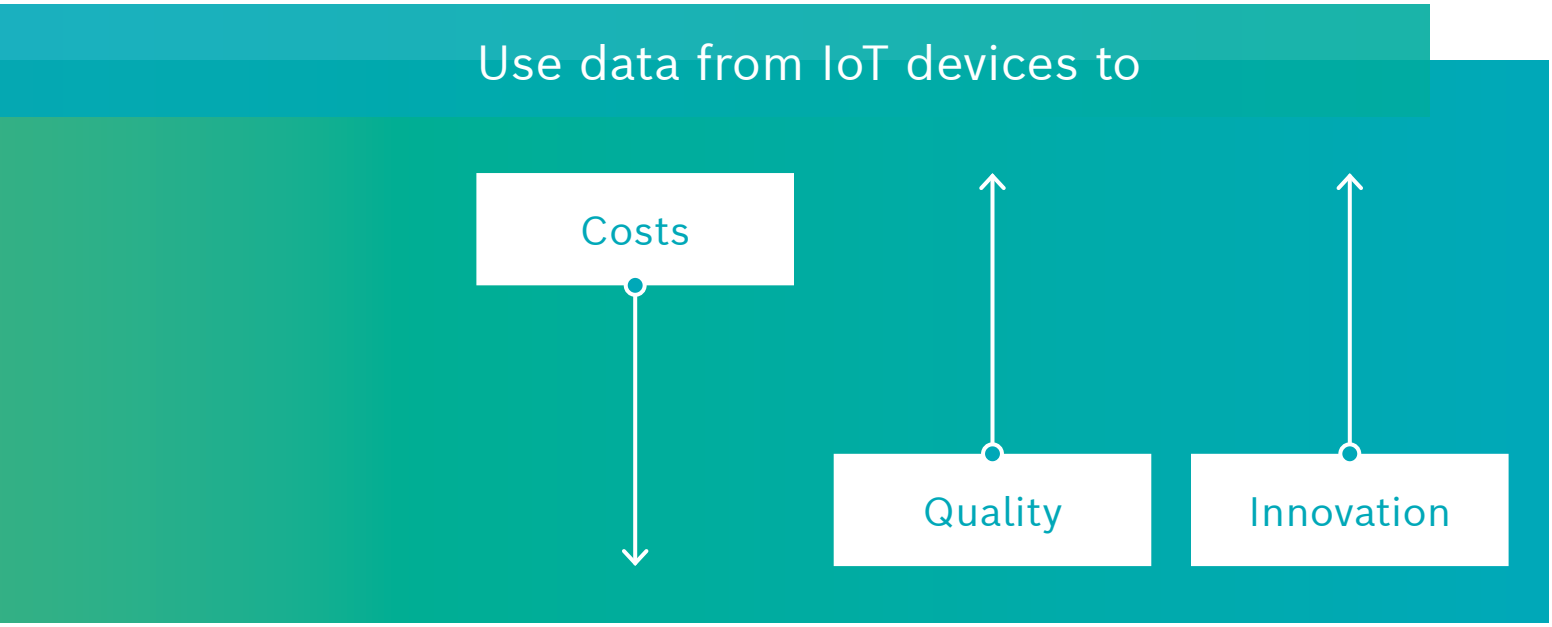
According to PAC and Reply[1], 70 percent of companies fail to analyze or use their IoT data. Amazingly, 99 percent[2] of all data generated by IoT devices remains unused. Equipped with a better understanding of the potential of IoT data, companies can enhance their products and develop customized solutions across the entire product lifecycle. What's more, IoT data can help improve process development from the test phase onward, enable faster recognition of problems in the field, and trigger the development of new data-based services.

How can we offer customized products?

How can we provide our customers with better support?

How do our customers actually use our products?

How can we improve our product development?




Graphic: Primary motivation of our customers to use IoT data.

[1] PAC & Reply (available in German language only)

[2] McKinsey & Company

# How to improve the organization of IoT data management projects


## First of all, designate a project manager

Data management is not a secondary task to be done alongside a normal workday routine. Our experience shows it should be undertaken by someone who is allocated sufficient time for this purpose. The precise amount of time depends on the number of products involved and the volume of data they generate. Three key questions:

- Have there already been data management projects at your organization?
- Is there experience of software tools at your organization?
- Do you already have a value-creation model, or do you still need to develop one?

If the answer to all three questions is negative, we recommend allocating at least 50 percent of the designated person's time for this purpose. This allocation can always be adjusted at a later date.


## Draw up and secure your budget

Our experience shows that data management projects are rarely allocated an adequate budget. There will be costs for the data management tools, for example, for project implementation (where appropriate), and for the people working on the project. Here, we would recommend starting with free test versions (e.g., www.developer.bosch-iot-suite.com/service/insights) and working out iteratively where the potential value lies.


## Involve all stakeholders

Before commencing your data management project, be sure to consult with all the major stakeholders. This will ensure that every aspect of the project is taken into consideration. This should include not only colleagues from IT but also:

- Product managers and engineers, who will provide valuable information on the product
- Marketing, which will provide key market information
- Quality management, which knows the key performance indicators and other criteria
- Sales, which knows which features customers want

4

## Encourage knowledge sharing within your organization

Particularly in large corporations, there are often departments that have already run their own data management projects or are already using software tools for this purpose. Perhaps, too, there are people in your company with experience in data intelligence. A project can benefit enormously from the fund of knowledge within an organization. Look closely, and you may well find that many of the questions or challenges involved have already been resolved somewhere along the line. At Bosch, for example, data management project managers from various divisions get together every three months to compare notes. These meetings generate valuable synergies. At first, they were mainly attended by people working on automotive projects, but now people from other areas also come along to share knowledge.

# How to improve the implementation of IoT data management projects


## First specify your use case, then gather the data

Unless you already have a data lake from which you can generate knowledge, it is advisable first of all to specify a concrete use case. Take your time here and be as precise as you can! This will radically simplify the design of your data management project. Questions you might like to ask include: Are there frequent problems with a specific product? Are there any ways in which customers use a particular product that you don't know about? Then you must decide which kind of data might help answer these questions and where it can be sourced. This will spare you the effort of gathering data that is not required for analysis and generating new knowledge.


## Include data from external sources

Newcomers to data management projects often assume they will have to gather the requisite data themselves. Yet it is worth checking whether data from an external source might serve your purpose or whether some of the data you require is already available elsewhere within your organization. Even if these data are not exactly what you want, they may still be able to answer 20 to 50 percent of the questions you are asking. External data might include a customer's own meteorological or inventory data.


## Data means more than just a time series

Time series are produced when a data point is repeatedly recorded over a period of time. This generates extensive data sets that are often used for data management projects in the automotive industry. Here, a time series might be derived from, for example, a vehicle reading that is recorded every 100 milliseconds. However, our experience shows that many questions can be answered without the need for this degree of data density. In many use cases, less complex data values, such as the maximum value and the average value, or a histogram will do the job just as well, thereby freeing up valuable memory space in the electronic control unit (ECU).

8

## Allow for hardware limitations

Once you have sorted out the tools and data for your project, don't forget to take into account any restrictions there may be on the hardware side. If not, you may well end up with a project that cannot be implemented with the available hardware. For example, how much memory do you have available? If your device has only 2-3 KB of spare memory, and data are only read out once a year, it will obviously not be feasible to save times series indefinitely.

9

## Connectivity is not always required

You do not necessarily need connectivity in order to gather data. In most of our automotive projects, the vehicles are not equipped with connectivity control units (CCUs). Instead, the data are gathered in the ECU and then read out later at the service center for further analysis. This does not diminish the value of the data in any way!

# General tips for IoT data management projects


## Involve your data-protection officer from the word go

Ensure that the data-protection department is involved in your data management project from the very beginning, i.e., from the design stage onward. Do not wait until implementation; this may well generate extra work and cause delays. Once you have defined use cases and the data required, the project can then be assessed for data-protection considerations and, if necessary, modified accordingly. This will ensure your project complies with data-protection laws.


## Draw up a contract for your data management project

If partners, customers, or third-party providers are involved in your data management project, it is advisable to draw up in advance a written agreement in accordance with the relevant legislation. This will ensure that everyone knows who has which rights of use to the data and information from the project. It is important to do this during the design phase and not to wait until the data is already flowing!


## Avoid developing your own tools

There are clear benefits to developing your own tools: they are specifically designed for your own use case and, initially at least, work very efficiently. However, as soon as a project becomes more complex or maintenance is required, things can often go wrong. As a rule, not only is it easier to start with off-the-shelf tools, but they are also cheaper and less complex. What's more, a lot of knowledge and experience has gone into their development – valuable know-how from which your own data management project can then greatly benefit.

# Find out more

We'd be delighted to show you how we work and what we can do to help you design and run your very own IoT data management projects.

Contact our IoT experts for further information and vital tips.

IoT Starter Package: **Get** your IoT Journey started

Free Plans:
**Test** Bosch IoT Suite for free

**Contact** our experts

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