

PROACTIVE MAINTENANCE AS A BASIS FOR NEW BUSINESS MODELS

FROM A PURE PRODUCT MANUFACTURER
TO A SERVICE COMPANY THANKS TO IIOT



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1. iConn COMPRESSOR SERVICE ENSURES COMPETITIVENESS

Industrial Internet of Things

In addition to increased competition, the requirements placed on manufacturing companies are also growing. Machines must be able to work continuously to satisfy the high level of demand on the market. However, 100% utilisation of production systems is hardly feasible in practice. Certain maintenance cycles are required to maintain product quality and prevent unexpected damage to machines. But at what intervals do you need to carry out maintenance? This is exactly where proactive maintenance comes into play! Nowadays, industrial companies

must take on an increasingly active role when it comes to software and service. The Industrial Internet of Things (IIoT) can help them here, to ensure they remain competitive – right into the future. Proactive maintenance, also called predictive maintenance (PM), is one of the key aspects when implementing IIoT in a company, and one which you should include as an essential part of your planning process. The IIoT journey helps us to see which steps must be included in an IIoT campaign to gradually minimise maintenance costs and other losses.

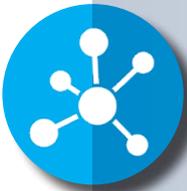
The IIoT forms a network of devices which are connected to the Internet and can thus collect and exchange data.

THE EVOLUTION OF PROACTIVE MAINTENANCE



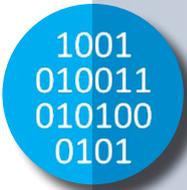
REACTIVE

The IIoT journey starts with a description of the old service model where interventions were not made until it was already too late. The Service team is contacted as soon as a part is faulty and they must then work out time-consuming solutions based on minimal feedback.



NETWORKED

As soon as the first devices are able to communicate with one another and forward selected data to the machine operator, the system status can be better evaluated. Less intervention is required from the Service team. And if the Service department is needed, they can determine the exact issue using remote diagnostics.



ANALYSED

This is the point at which the era of proactive maintenance begins. Analysing the data gathered allows valuable conclusions to be drawn. The service technician knows when the next maintenance interval is due thanks to clear Indicators such as production time and tool wear



PROACTIVE

The entire IIoT journey essentially revolves around just one thing – optimisation. Before IIoT, the initial prototype plans were usually based on rough customer requirements and certain rules of thumb. Increasing networking allows real time information about a product to be monitored and developers know which properties they need to focus on. Targeted optimisation also means that the period between maintenance work can be optimised.

2. HOW IIoT ENABLES PROACTIVE MAINTENANCE

Proactive maintenance has a direct influence on operating costs. The money saved amounts to several thousand euros a month for industrial systems. Monitoring can pay off for compressed air generation as well.

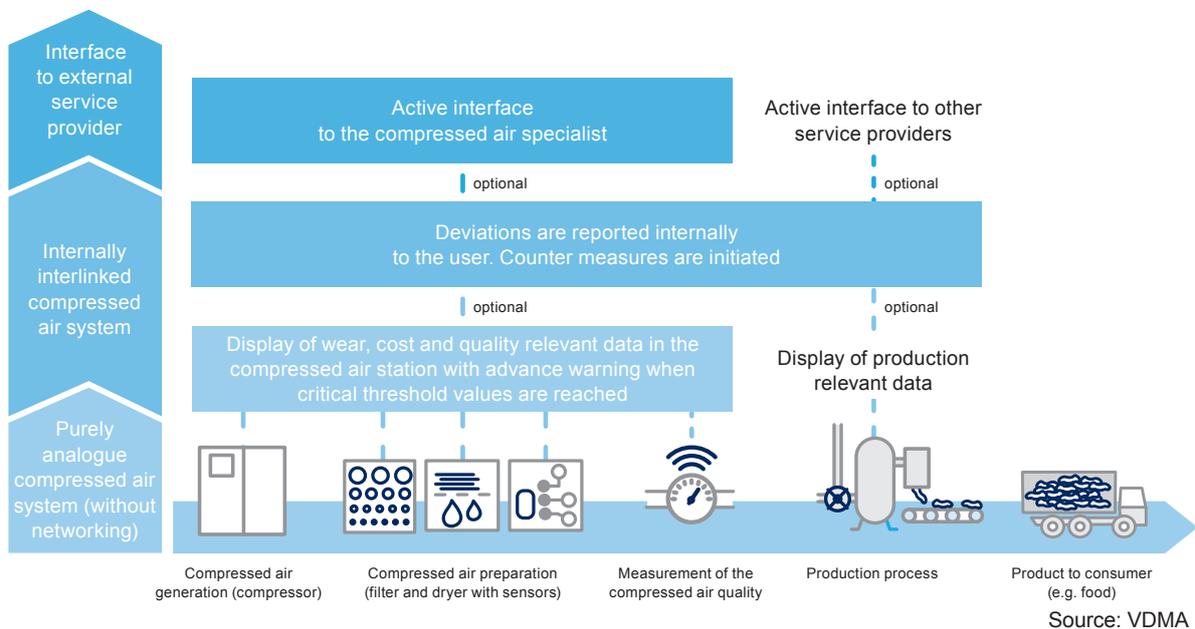
Along with cloud technology and appropriate software, sensors form the heart of the IIoT. They help us to better understand the machines. Developments in the field of sensor technology have resulted in ever smaller and more cost-effective components, making IIoT measures affordable for medium-sized companies too.

NETWORKING IN A COMPRESSED AIR PLANT

Digital networking of the components in a compressed air plant (such as the compressor, filter and dryer) can minimise costs and increase availability of the plant.

Networking is a key factor when it comes to making savings – it has an influence on and reduces energy and service costs while also leading to greater process reliability and cost control.

Digital networking provides data relevant to wear, costs and quality. It can help you to significantly increase functional reliability and productivity. Savings due to a reduction in operating costs pay for your investment in a very short time frame.



Source: VDMA

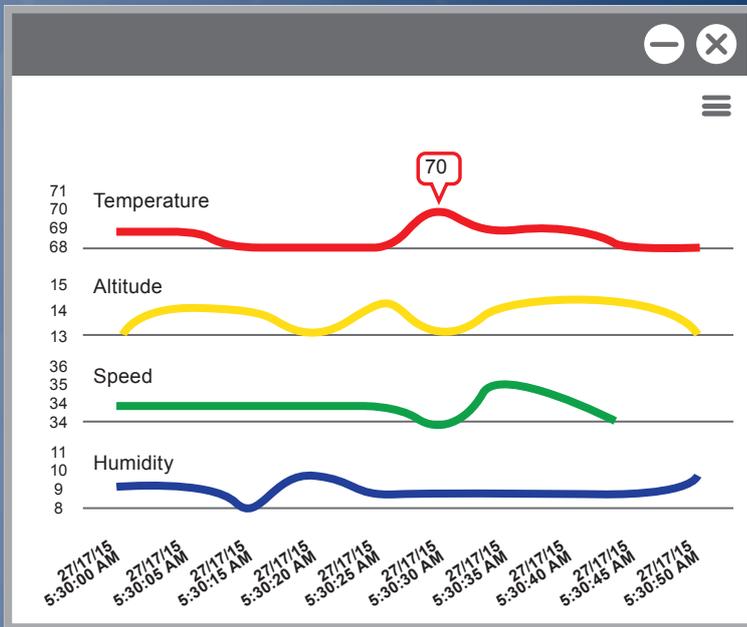
As soon as a component is equipped with sensors and networked via the IIoT, it can share messages with the Service department. This gives the Service team precise information about when standard inspections need to be performed or if a component reaches its limit prematurely. To ensure timely intervention, devices must be equipped with intelligent sensors and smart software to forward detailed information about the machine to the relevant departments.

MAINTENANCE REQUIREMENTS ARE MAINLY BASED ON TWO CRITERIA:

1. Detailed information about the plant such as functions and historical machine data

2. Environmental factors such as weather conditions, room temperature, humidity

The environmental factors may place differing requirements on the same machine. An on-site inspection is therefore essential if you want to get the most out of an IIoT measure. The sensors must be precisely coordinated and provide reliable machine data which is relevant to the Service department. As a key technology for the IIoT, the Cloud represents a suitable basis for calling up data from anywhere. IIoT software then enables relevant data to be bundled in real time and represented on dashboards.



PREDICTIVE ANALYSIS

Sensors report the status of the monitored systems in real time. The data is then collected and analysed on a Cloud-based IIoT platform. Defined parameters such as temperature, height, speed and humidity can be observed and evaluated over a specific period of time.

The meshing of three key wheels in the IIoT gears forms the basis for functional proactive maintenance:

1. Sensor technology incl. gateway and transport
2. Cloud technology
3. IIoT software

THE ADVANTAGES OF A CLOUD-BASED IIoT PLATFORM AT A GLANCE



Saves on hardware costs

IIoT can be flexibly expanded

Automatic software updates

Cloud-based backups

Data can be shared with ease



3. THE ADVANTAGES OF PROACTIVE MAINTENANCE

“Maintenance intervals shouldn’t always be based on precise cycles, but on actual needs!”



REACTIVE REPAIR REQUESTS

VS

PROACTIVE MAINTENANCE



NOTIFICATION

Reactive repair requests

The out-dated service model only acts when there is a specific problem, i.e. when a call comes into the Service department because something has gone wrong with product A or B. A couple of standard questions are clarified and then used in an attempt to assess the fault. However, an on-site visit is often required to shed light on the actual issue. The problem of course is when the Service employee does not have the right tool to hand to repair the plant.

Proactive maintenance

Temperature, infrared, vibration and sound alarms in the machine monitor all the functions and feed this data to the network. Service employees can monitor the developments, while early-warning signals make them aware of upcoming maintenance work. In addition to sensors, the alarm system must also be reliably implemented in the system so that error messages reach the relevant Service department without delay.



FEEDBACK

Reactive repair requests

There are no troubleshooting instructions whatsoever for reactive repair requests. Automatic feedback helps to identify the cause of the fault and resolve it more quickly, which in turn saves costs. If the machine operator only knows that they need to carry out maintenance or a repair but not where or to what extent, this information is of little use.

Proactive maintenance

Intelligent machine systems are able to forward assistance and evaluations from incidents and problems via the IIoT. Advisory maintenance assistants which not only point out specific maintenance activities in a timely manner but engage directly with the Service technician and recommend actions are conceivable here. The machine thus acts as a patient who can determine where the pain is and what intervention is needed to alleviate it.



SERVICE

Reactive repair requests

Reactive service only intervenes once it is too late. So the only option that remains is to replace components or dispose of the machine. Both cases mean downtime for the customer. If this lasts too long, the Service team are automatically regarded as a problem and the customer may opt for a different manufacturer.

Proactive maintenance

Thanks to “Connected Services”, the health of a product can be monitored on the manufacturer’s side so that they can inform the customer in good time and avoid more expensive repair measures. Enhanced dialogue with the customer allows manufacturers to focus more intensely on the benefits and the requirements of their products. However, this extended customer dialogue must not become a time guzzler! Many aspects can be processed with automatic customer service.



OPTIMISATION

Reactive repair requests

At the end of the IIoT value-added chain is the continuous optimisation process. Optimisation before IIoT was less targeted and expensive. Elaborate test series and long planning phases also have a negative effect on the maintenance service. The principle is: if you don’t know the customer’s concerns, you can’t meet them.

Proactive maintenance

Once the products are linked to IIoT, their functions can be closely monitored. With 24/7 IIoT, an enormous amount of data can be collected, which helps developers and users to continuously improve the performance of their system. Modern IIoT software enables the creation of a software-based prototype, the so-called “digital twin”, which can be tested under various parameters – without the need for time-consuming test runs in reality. A more precise test phase also allows maintenance units to be effectively shortened.

THE ADVANTAGES OF PROACTIVE MAINTENANCE AT A GLANCE

Timely maintenance for increasing the operating time

Better planning of maintenance work to reduce unnecessary field service calls

Optimisation of parts exchange and spare parts management

Fewer 'unplanned stops' and shorter 'planned stops'

Better machine performance

ONE THIRD OF MAINTENANCE COSTS IS A WASTE.

The aim of proactive maintenance measures is always “zero unplanned downtime”, according to which maintenance intervals are only based on demand and without waste. Of course, this aim is not met immediately after implementing the first IIoT measure, but working toward it is an important step forwards!



4. WHAT IS iConn SMART COMPRESSOR SERVICE 4.0



WHY SHOULD YOU ACTIVATE iConn?

Absolute Efficiency. Absolute Security

Not only does iConn allow deviations from the optimal plant condition to be detected early and counter-measures to be initiated, meaning that expensive failures and downtime is avoided, maintenance intervals are no longer time-controlled – but are based on individual component wear and actual system requirements.

Further more, confidentiality, data integrity, authenticity and protection are ALL guaranteed.

iConn from CompAir – changing the way we do business.

iConn BENEFITS AT A GLANCE

Proactive real-time monitoring with iConn for your compressed air installation, delivers many benefits:



Real-time operating data available around the clock



Wear of compressed air components is **identified early**



On-demand maintenance **extends compressor life cycle** and **optimises costs**



Reduce operating costs caused by increased pressure drop in filters and separators through late maintenance



Maximum compressor performance **reduces energy consumption**



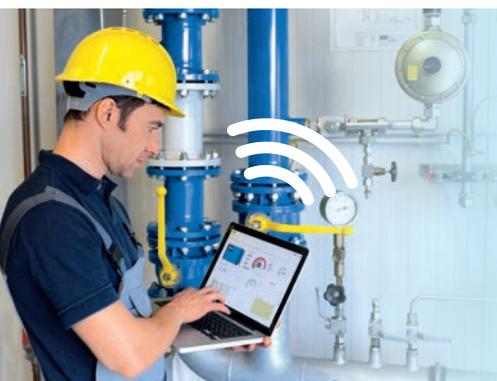
Identify **potential savings** by measuring costs and efficiency



Predictive and preventative monitoring and warnings **avoid expensive downtime**



Optimised maintenance planning



“iConn allows you to remain connected to your compressed air station at all times, from anywhere – for greater efficiency, productivity and to protect your investment.”



5. PROACTIVE MAINTENANCE BECOMES PROACTIVE SERVICE



NEW BUSINESS MODELS AND INNOVATION AS A RESULT

Nowadays, customers place more stringent requirements on manufacturing companies. They do not want to throw away their products or replace them with a new device over the slightest fault.

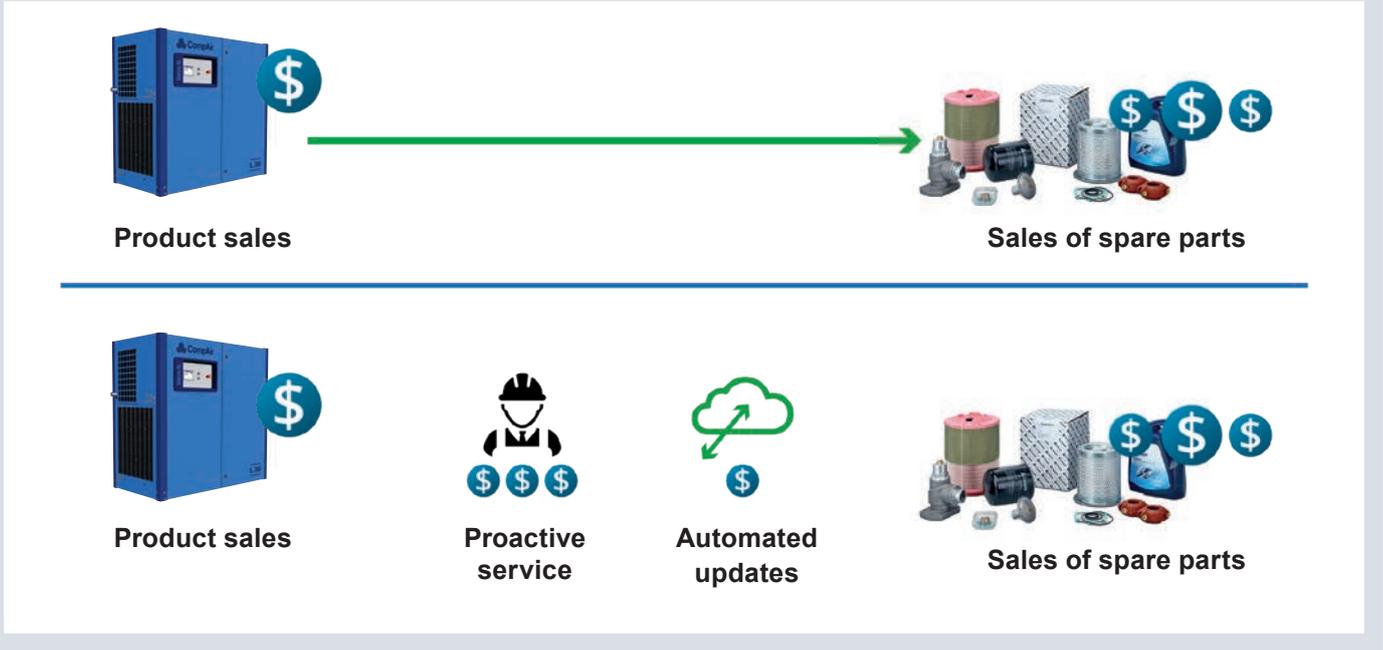
Proactive maintenance intervenes at an earlier point in the process and in many cases it prevents a fault, which can often be traced back to insufficient maintenance or incorrect use. Sensors are becoming increasingly cheaper and more powerful, thanks to intensive development work, which means the possibilities are endless for IIoT experts. You can equip your products with an unlimited number of touchpoints and set up comprehensive real-time analysis which forms the basis for an innovative company.

The rising volumes of data offer a vast amount of information – choose what you really need! Experts can tell you which touchpoints you and your customers need for assessment, based on analysis and experience.

For proactive maintenance to realise its full potential, the right information must be provided at the right time. That's the key to IIoT!

IIoT turns manufacturing companies into service providers. Examples ranging from large corporations to medium-sized companies clearly show how IIoT initiatives extend the business model with new services. Not only does the Industrial Internet of Things enable companies to expand their business model, it also reduces their dependence on pure product sales at the same time. Smart, proactive maintenance is based on monitoring which allows you to monitor the status data of thousands of machines and systems simultaneously.

Why not provide this data to your customers as a service?



“Product-as-a-Service” models are far more competitive than traditional business models. This is because – once implemented – gathering data is not very expensive, but the benefits are huge – you can then offer proactive service as an additional product feature, setting you apart from your competition.



6. THESE FACTORS ARE DECISIVE TO THE SUCCESS OF YOUR NEW LINE OF BUSINESS

To ensure a new business model will provide lasting success, you need to ask yourself a few questions first. How do you get an IIoT campaign off to a successful start? What needs to be done right away and what can wait? You should be able to clearly define which services will actually drive your company forward and which data you need to do so. The data collected must be gathered, analysed and managed.

This effort creates added value – in doing so, it is important that your IIoT campaign is planned for the long term and suitable software is selected. No company departments should be neglected when it comes to networking. Avoid isolated solutions and include Production, IT, Service, Quality Management, your Sales team and also your suppliers in your IIoT network. Although analysis is often

restricted to individual products and systems and their selective errors, one fault in the product cycle can quickly spread to the entire process. For example, stock levels should always be adjusted in line with demand in Production and bottlenecks avoided by exchanging information with suppliers.

Also focus your analysis on values that you can use to measure your company's success, such as downtime, failure rates, product quality and troubleshooting speed. Proactive maintenance is a key cost factor which influences productivity, competitiveness and the product life cycle. To establish new services and sustainably optimise production, you need to be in a position to seamlessly record dependencies and details in your company.

Evaluate the following factors in advance to achieve the best values from proactive maintenance and service offerings:

1. Carefully determine the environment of the systems, devices and machines to be maintained.
2. Ensure that the systems or products also fulfil the requirements of an IIoT solution.
3. You should check the extent to which IIoT-integrated devices could be extended to others.
4. Factor in short downtimes during the introduction.
5. Identify the most important data for subsequent evaluation.
6. If you mainly want to control proactive service via a Cloud solution, you must determine where this can be hosted.
7. Suitable IIoT software must be implemented.
8. You must ask yourself whether error messages or maintenance measures can also be resolved/performed by the machine on its own or whether a maintenance technician would need to intervene.
9. Each measure must be checked with regard to profitability based on the ROI (return on investment).

Smart, proactive maintenance requires a proper plan of action and correctly defined interfaces. Seek advice from a qualified IIoT expert during implementation. We can show you how proactive maintenance can save you money and how you can build new business models with proactive services.

**Secure your competitive advantage today
with the iConn smart compressor service 4.0!** 

7. iConn Digital Security Principles



From the very beginning, we have dedicated the focus of iConn to security. Understanding and adhering to security principles is paramount for ensuring the resilience and reliability of our digital services platform.

As we believe that security must be rooted deeply in both our product and our organization itself, we follow the approach of “Security by Design”. Consequently, we consider potential security challenges right from the planning stage and build our products to overcome them. True to our belief that security is not just a matter of technical implementation but a practiced attitude, we accompany our products throughout their entire life cycle.

Driven by a risk-based approach to Cybersecurity, our primary focus is to prevent any harmful interference of the devices and services we introduce onto your assets and IT/OT infrastructure. Moreover, we are also strongly concerned with Information Security, which means that we keep your data safe from any unauthorized access, corruption, or falsification during creation, transport, and storage.

Finally, today, all our security interfaces have been implemented in a future-proof manner over the entire IT infrastructure. This implies that future IT Security challenges can be adapted at short notice to ensure the highest possible level of protection.



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