



SMARTCONTROL 

THE SMARTER WAY
TO CONTROL YOUR
METALWORKING FLUID
MANAGEMENT.

Big data systems are accelerating the 4th industrial revolution

Castrol SMARTCONTROL keeps track of machines and their health

During the G20 summit in January 2019, the key message of the Japanese Prime Minister Shinzo Abe was that data is the oil of the new century. Many companies are also recognising this fact, and they are investing in big data solutions which analyse their data and deliver appropriate insights. In this way, they are forming the foundation for better decision-making and, along the way, they are supporting companies in order to keep pace with the digital world. Big data applications are also demonstrating their strength in the context of Industry 4.0. The European manufacturing industry - in this case the automotive sector in particular - has understood the importance of data in an increasingly interconnected world.

Nevertheless, companies often are perplexed when facing such opportunities and challenges. An effective implementation of data-driven solutions is extremely important for these companies, and its advantages become apparent almost immediately. These advantages include cost-savings through improved utilization of machinery, greater overall effectiveness, and even lower material consumption. Overall, companies are able to achieve savings that are in the double-digit percentage range.

However, outdated legacy infrastructures are among the greatest challenges. Another challenge is related less to hardware than to the attitude of the employees. For years, they have been used to a certain way of working which is difficult for them to give up. This is where companies will often face resistance and/or rejection. For example, it is not common for automotive companies to share their data. However, in a world of linked production facilities, processes, and supply chains, data must be shared - with the result that all participants will be able to make correct decisions in real time. Only when such sharing becomes a reality will automotive manufacturers and their suppliers remain successful in global competition. The Industrial Internet of Things (IIoT) is the physical framework which is propelling the 4th industrial revolution forward. Sensors and monitoring software are available and are being installed - in fact across the entire value-added chain. Now, these individual elements must be linked with one another. Only then will automotive companies benefit from swifter throughput, higher visibility of and control over their respective production processes, as well as greater performance and improved profitability.

Data: intelligent use is the key to success

In the meantime, data is the key to a successful and profitable production process. However, in order for data to be used most effectively, it must be shared. It is imperative to analyse the data both in order to understand it and to identify and understand the information it contains. Only then can data be used in the best possible way. BP and Castrol are collaborating closely with their partners in order to use existing data and to develop new technologies and products based on this information. This effort also includes the development of new materials or, for example, developing the behaviour of metal surfaces under extreme conditions.

The advent IoT means that more objects and equipment are being connected to the Internet – and they are collecting data about customer use patterns and production output. Machine learning has further accelerated this flood of data. Traditional data processing software is no longer able to handle all of this data, but new processes are making it possible to use this data to solve problems which companies were previously unable to solve or even be aware of.

But is the 4th Industrial Revolution (4IR) something that will truly help production, or is it only oriented towards companies that are selling services? How can companies benefit from the 4IR? How will the 4IR control and manage the development process? How does the true value of an industrial data strategy become apparent in the age of 4IR? These are all questions which companies in the producing industry must ask - ideally before they invest in hardware, software and services. Optimising profitability will always be one of the main objectives of every company. The industry will and must produce more rapidly and more effectively with less waste, less reworking, more reliability, greater transparency and improved quality. Moreover, the industry will understand its customers immediately better and satisfy them with products that fulfil their individual needs - in order to achieve mass connectivity and make mass adjustments. This should all take place while simultaneously controlling costs.



Big data analyses based on real time data enable a longer lifespan for machinery.

Castrol offers big data analysis platforms to companies

For years, Castrol has collected large volumes of data and used them to improve the performance of our industrial lubricants and to develop innovations in this field. We were able to demonstrate cost-reducing measures at the machine level. Among them, we demonstrated a significant prolongation of the shelf life of the oil and the useful life of the machine. This was accomplished using semi-manual systems. These relatively small gains - which are nevertheless verifiable - will during the next step be automated and integrated into the learning and control systems of the machinery and at the plant level before being upgraded for global commercial advantage. But why were the available data, systems, and analyses not already used? For example, we have a large volume of data regarding energy consumption. Is this information being effectively used to keep costs as low as possible? At the moment, this is not yet true. In part, the reason for this is that the data are not yet available in real time, so it is not possible to make adjustments directly. This option exists, but it must be used.

In the past, the industry has undertaken a series of local or regional activities, some of them only within a single plant. Unfortunately, these projects and studies are not catalogued in a meaningful manner. There are case studies which only treat individual aspects such as the reduction of operating costs, efficiency and storage shelf life or the surface condition, the prolongation of usable life, lower maintenance expenditure and surface effects of lubricants. They mention almost in passing the fact that the case studies demonstrated that if, for example, a synthetic base oil is used in plastic moulding technology, 30 per cent less heat is generated than if the existing transmission fluid is used. This indicates energy savings through flow rate efficiency. However, all these things are rather hidden, e.g., as footnotes in the case studies. Data analysis can combine this information and provide it rapidly and in real time, and it can then form the basis for making decisions in a more substantiated and effective manner. Production facilities and an associated company can use the benefits of 4IR in this context, but doing so requires leadership. It must be propelled forward by those who support the development of this 4th industrial revolution and who want to reap the rewards of it.



Data analyses provide information about the health of machinery enabling companies to intervene more swiftly than in the past when problems arise

However, time is a luxury which the economy as a whole and companies in particular cannot afford. The future has already started. If organisations are not proactive in researching and

utilizing the technologies and techniques of 4IR to connect their machines, production facilities, customers and supply chains with IIoT, they cannot be competitive. On the other hand, big data must also affect finances, costs, efficiency and profitability. Only then will the bene

fits of data analyses be able to be fully utilised.

Large data solutions can contribute to improving production and operational efficiency while offering a 360-degree view of the processes, which can lead to the making of an improved and timely decision. Companies can analyse a number of data sources using a data-enriched architecture in order to gain better insights. This in turn expands the possibilities of analysis and forecast in order to achieve better results.

Production companies require meaningful information, which now stem from a growing number and bandwidth of data sources, including among them: operating systems, operational processes and supply chain sensors, PLM databases (Product Lifecycle Management), demand and price realisation, financial forecasts, and even websites and social media. The collection and management of data enables manufacturers to improve the forecast for product acceptance and to optimise production accordingly. As a result, customers will receive better services and swifter support. In addition, performance data can be rationalised across several plants; this enables providing a better analysis of supplier performance. Castrol developed its Castrol SmartControl solutions specifically for this purpose. It controls the operation of machines in real time and it delivers data on their output.

The opportunities include: becoming the leader in the development and implementation of 4IR

In addition to a series of challenges, the introduction of big data solutions (such as Castrol SmartControl) provides a number of possibilities for improving existing processes.

The Big Five in big data and 4IR can be summarized as follows:



1. Improved transparency and control of processes

The use of sensors and monitors on machines has already been proven. Knowing what is being used as well as where, why, and how increases control. Greater transparency along the entire supply chain improves logistics management, reduces the need for warehousing, thus reducing costs. Real time information keeps employees informed about the production progress and provides an overview of the function and utilisation of the machinery.



2. Fewer rejects

Real time data analysis also improves the control, management, and reduction of rejected material. Managers have direct real time insight into whether standard operational processes are being followed - this remotely and across a number of sites. The disappearance of physical stock is a significant and costly problem for companies in the manufacturing industry— and one that is relatively easy to prevent using effective control and tracking. The networking of machines, systems, and components in this context is a huge plus for companies.



3. Intelligent production facilities and the improved application of skills

Humans are expensive; skilled employees are even more expensive. If machines can control themselves to a certain degree (via sensors), fewer people are needed to control them. They will be able to apply their knowledge and their skills not only for monitoring but also for solving problems and optimising processes.



4. New ways of thinking and a new culture of production excellence

No one can force companies to adapt a culture of excellence. It requires a rethinking process within the organisation. The 4th industrial revolution is able to provide technologies which enable employees to distinguish themselves. Even more importantly, it can reduce obstacles and frustration, thus generating a company climate that motivates employees.



5. Improved, communicable return on investment

Integrated line and production processes are more efficient. Doing so requires investment; on the other hand, improved control reduces the time it takes to install machines and to implement technologies. At the same time, there are significantly fewer start-up problems, thus enabling companies to get the most out of their assets.

NEW: CASTROL SMARTCONTROL


Castrol SmartControl delivers measurements of the main parameters of your metalworking fluids in real time and makes it possible to automate a large number of tasks that you used to have to take care of manually.

24/7
lubricant analysis

CONTROL AND SAFETY 24/7

MEASUREMENT IN REAL TIME OF:

- CONCENTRATION: 7.5% Concentration
- pH LEVEL: 9.2 pH Level
- CONDUCTIVITY: 910 μ S Conductivity
- TEMPERATURE: 25° Temperature
- VOLUME FLOW: 6 l/s Volume flow
- OPTIONAL: NITRITE CONTENT: 20 ppm Nitrite content



The Castrol SmartControl solution collects and evaluates machine data in real time.

The solution: a data strategy with numerous advantages

Based on a detailed and automated analysis of collected data, production companies are able to view the status of their machines in real time - ideally being able to schedule maintenance work if a potential problem is indicated. This reduces downtimes and potential damage to machines. Castrol SmartControl is one example showing how big data is entering the world of production. Thanks to Castrol SmartControl, machine parameters can be checked in real time. The measured parameters include concentration, pH, conductivity, and temperature. The nitrate concentration can be measured as an option. Therefore, companies receive detailed information about the smooth function of their machines - or any problems, which then can be swiftly identified and solved.

In addition, companies protect their investments better than in the past by using such a data-based proactive maintenance and problem solution. Companies benefit in many ways from such a sophisticated big data analysis: Their machines run with fewer interruptions, and downtimes are reduced along with any serious system errors. Moreover, companies need to invest less of their budget in maintenance. They can deliver produced goods more rapidly, which increases customer satisfaction - all of this based on data already stored at the company which in most cases had not yet been analysed.

For further information, go to Castrol.com/Smartcontrol

This white paper includes extracts from the publications of:

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EUROPE'S AUTOMAKERS ARE TURNING BIG DATA INTO EVEN BIGGER OPPORTUNITIES. WE HELP MAKE IT HAPPEN. CASTROL!

IT'S MORE THAN JUST OIL. IT'S LIQUID ENGINEERING.™

