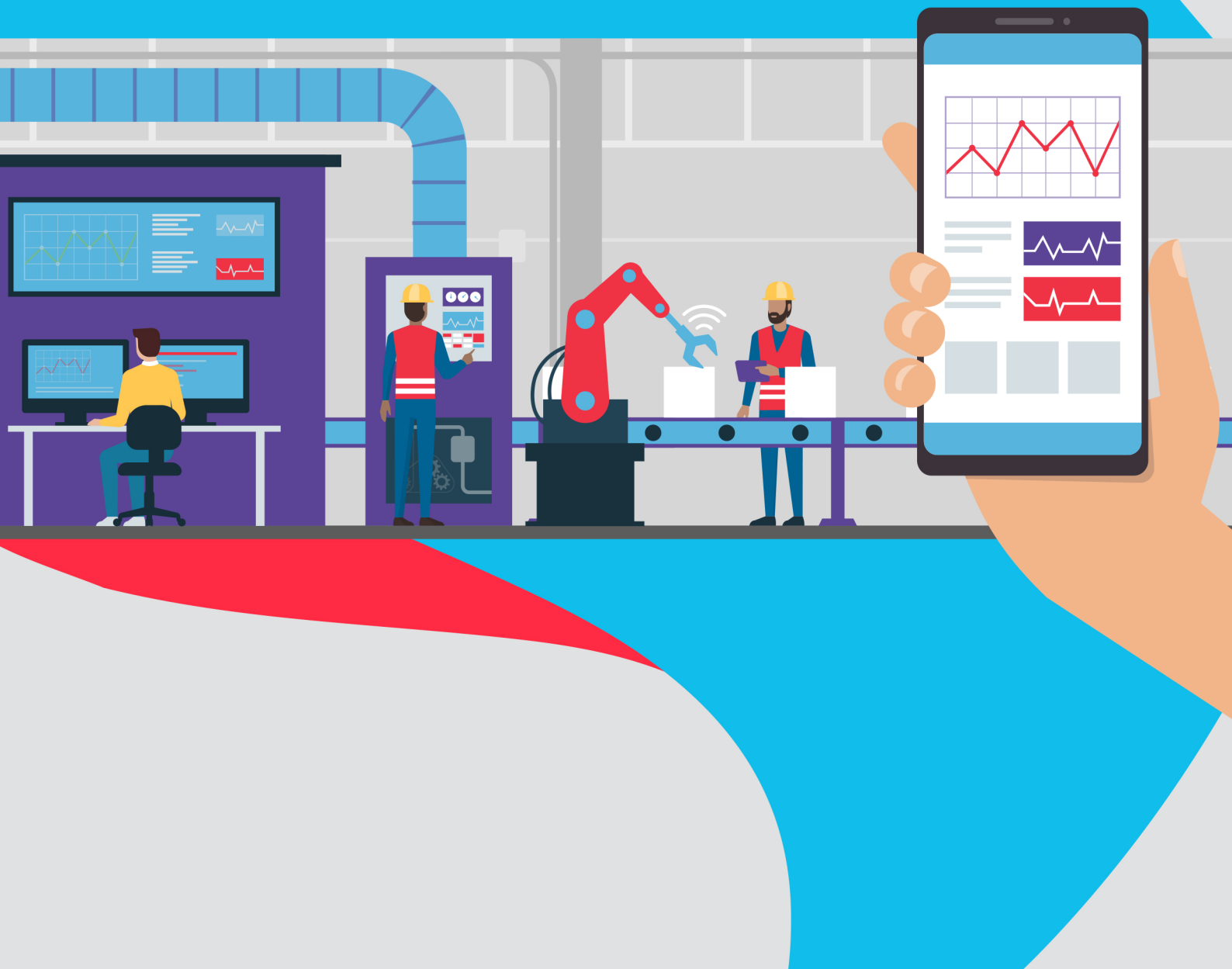
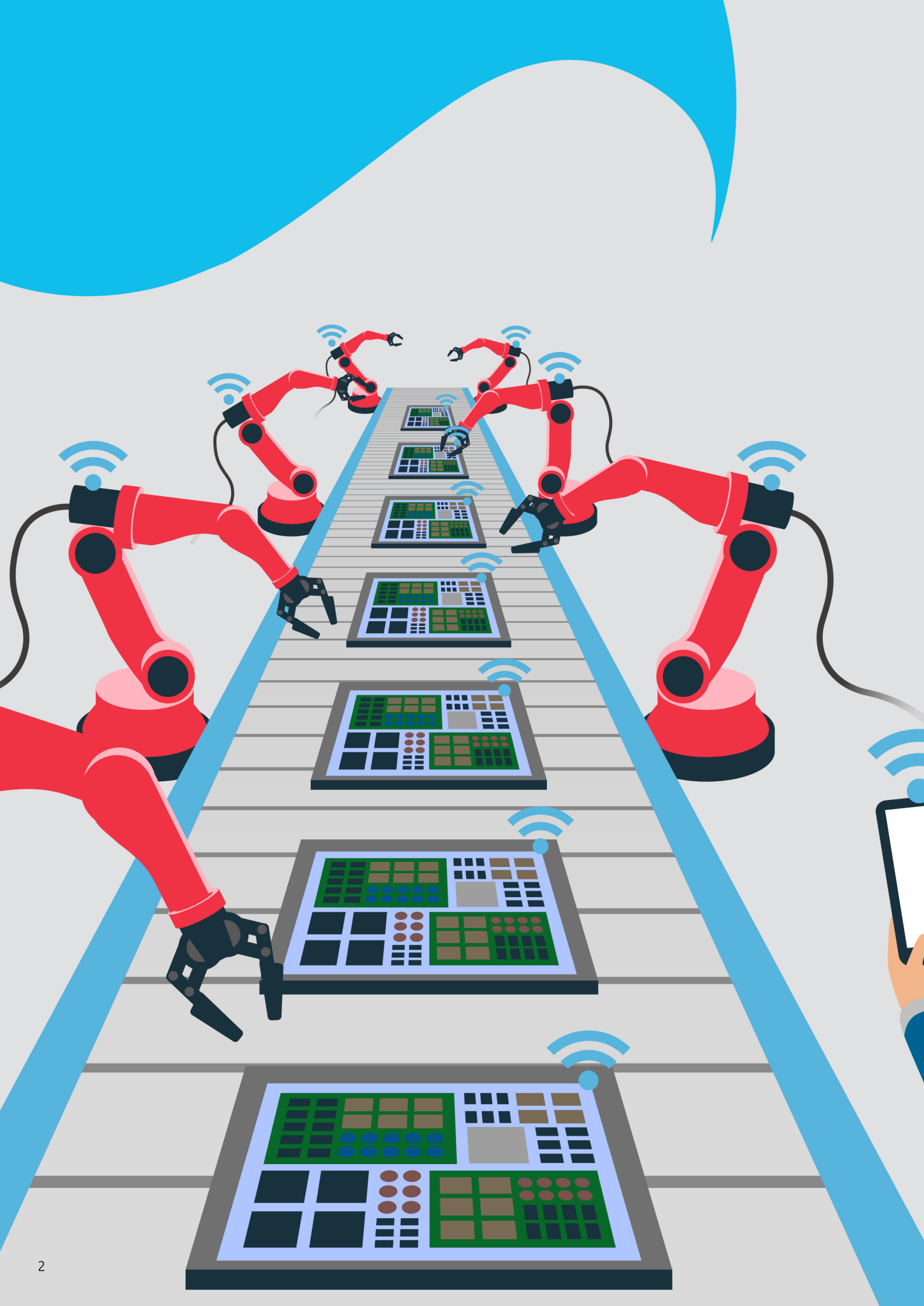


Manufacturing & Plant Intelligence

Turning production
& assets data into actionable benefits





Manufacturing & Plant Intelligence leverage the now ubiquitous shop floor data sources provided by smart manufacturing equipment, connected sensors and a wealth of IIoT devices to significantly improve the performance of your industrial operations.

At Capgemini, we provide end-to-end portfolio of services to make the most of these new assets.



Manufacturing and Plant Intelligence Services

Create value from your data and improve your products and quality

Digital technologies are transforming every link in the manufacturing value chain: from research and development, supply chain, and factory operations to marketing, sales, and service. They can release enormous value among workers and industrial assets and change the manufacturing landscape forever.

However, transforming digitally requires rethinking the whole organization as operations and information technology converge.

Capgemini addresses major industrial organizations digital imperatives with, among others, Manufacturing Intelligence - Data Analytics applied to products and plants – data science and maintenance analytics.

Our end-to-end services are designed to empower your manufacturing organizations to continuously launch improvement initiatives, apply best-of-breed standards, take preventive actions and stay on budget.

By leveraging a unique status as a management consulting, IT, and engineering company, Capgemini delivers optimized, purpose-built solutions that are both sustainable and scalable.

Rather than producing market-based copies of solutions, we consider your circumstances for designing a customized package.

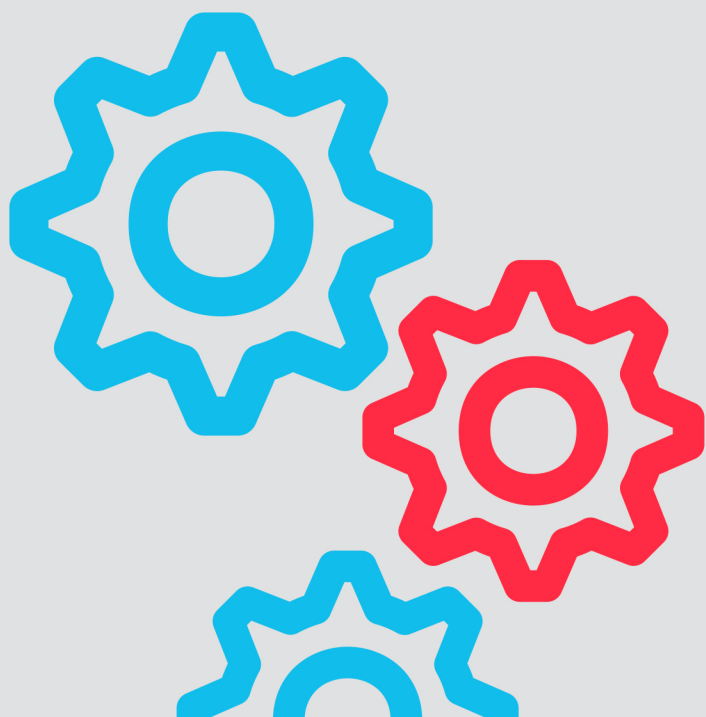
Manufacturing Intelligence and Plant Intelligence: the two facets of Manufacturing Analytics

Manufacturing Intelligence produces results intended for the shop floor that focus on improving both product and manufacturing processes in order to improve production quality and performance. It identifies the production parameters which impact the achievement of your targets and, guide you to defining the best settings for those.

Plant Intelligence leverages the actual usage pattern of production equipment rather than plain time or age factors to optimize servicing and maintenance.

It is used to detect machine failures before they occur and give your company suitable time to schedule service activities in advance, avoiding production downtime as well as the extra costs of over servicing.

Manufacturing Intelligence and Assets Intelligence mostly use the same data but provide complementary benefits to different levels of your production line and enhance its efficiency.



Plant Intelligence

Benefits grow as Data sets extend

Maintenance

- Operating report (CMMS)
- Maintenance plan

Quality

- Scrap
- Dimensional control
- Procedure
- Setting sheet

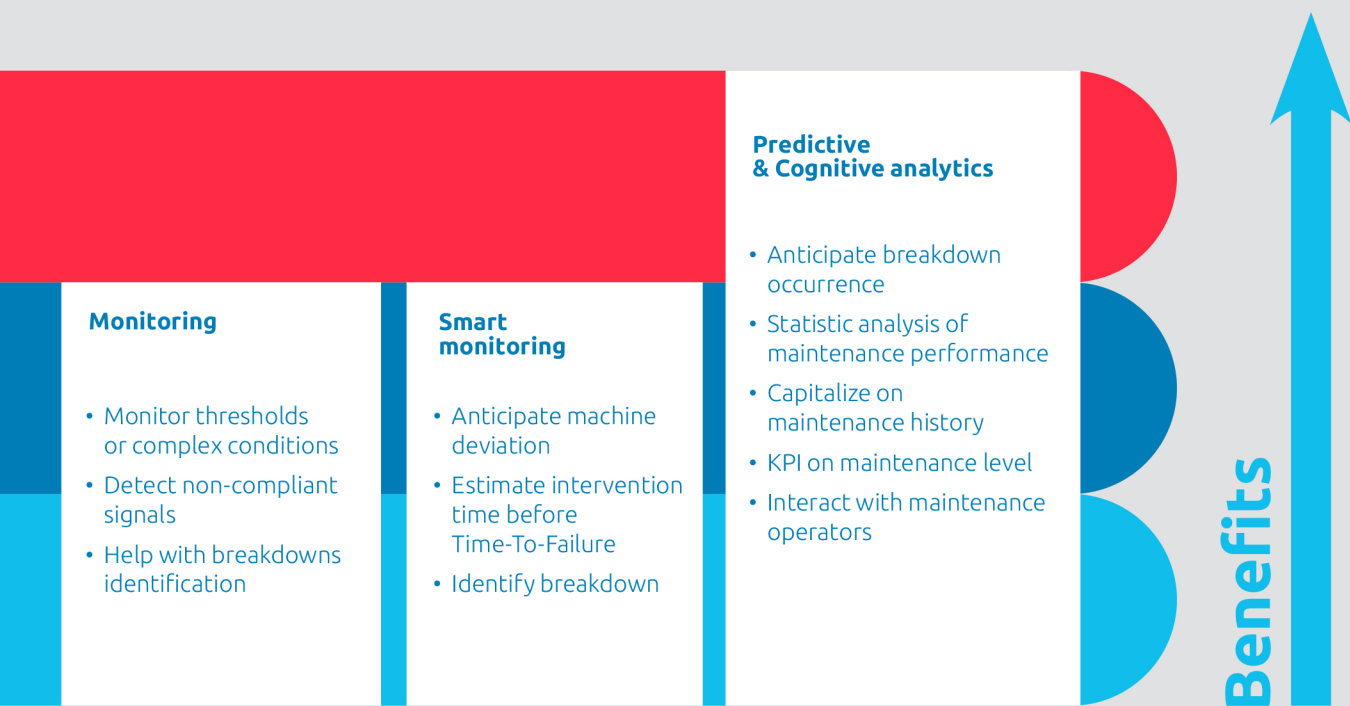
Machine

- Numerical values
- Machine status
- Logs
- Settings / Adjustments

Visualization

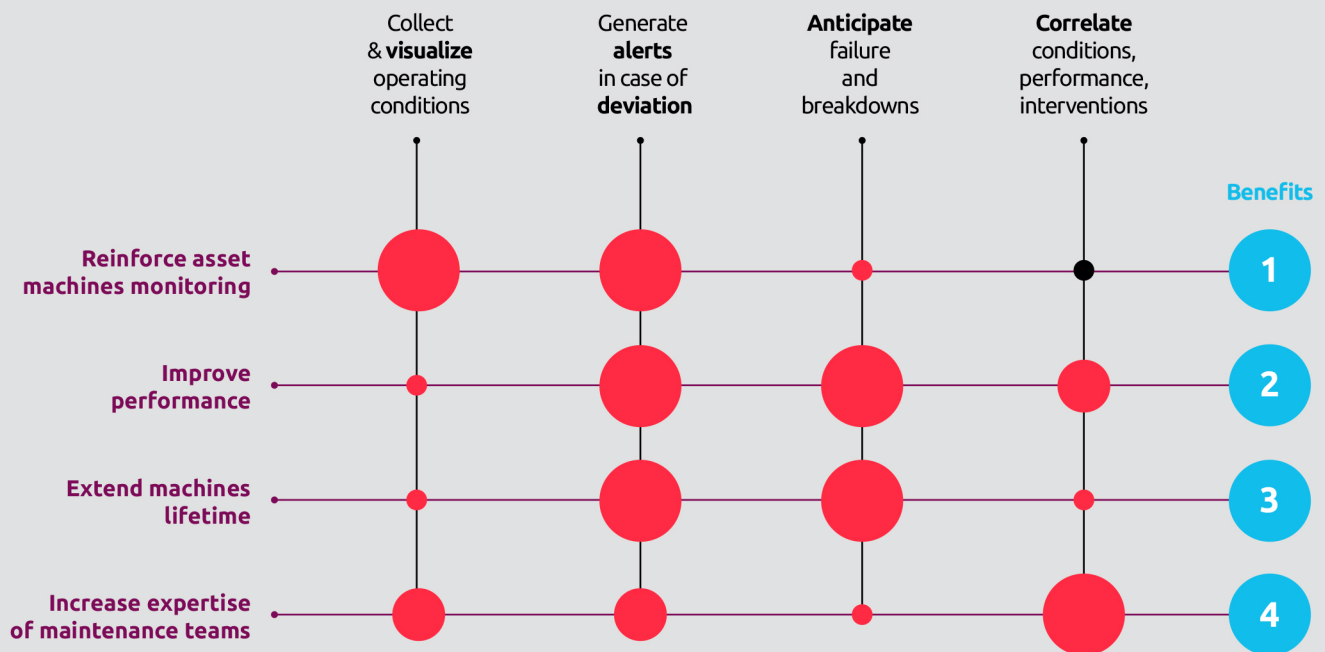
- ANDON
- Raw values
- Counting

Available data



Depending on your available data, your history and your maturity, our solution can quickly deploy functionalities to make a first profit, then work in time to improve maintenance and performance.

How Maintenance Analytics can solve operational issues



1

Identify the risk of breakdowns / malfunctions **before** they occur
Simulate factually the operating conditions vs equipment **functioning**
Reduce repairs costs

2

Reduce / avoid the periods where functioning may **alter** the equipment

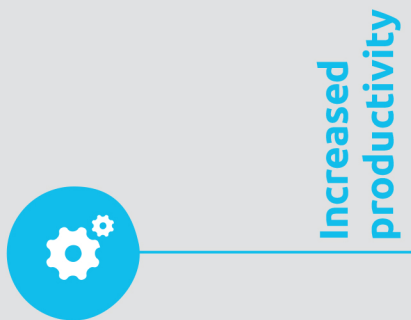
3

Optimise the interventions: out of production plan, more targeted, assistance to diagnosis, reduce costs of machines work reactivation
Increase OEE (3 to 10pts)

4

Identify **the cause** of the breakdowns
 Display **factual information** to reveal internal operation of the machine
 Help to **diagnosis, advanced analysis** of the impact of performed interventions

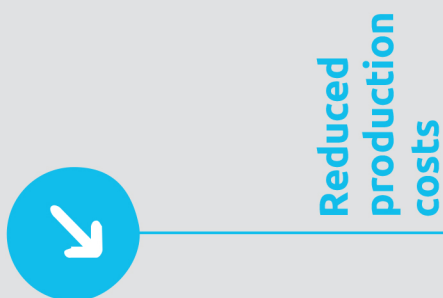
Facts & figures



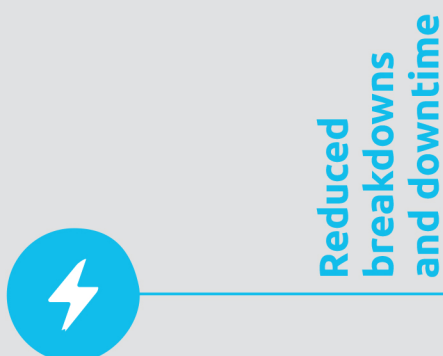
- Improved OEE
- Identification and reduction of bottlenecks (enhanced traceability and visibility on operations and processes)
- Optimization of process through an enhanced knowledge and real-time vision
- Fast and effective industrialization of new products



- Anticipation of non-quality with alerts and recommendations
- Identification and systematic enforcement of best manufacturing conditions
- Non-quality reduction by connecting ERP data and shop floor data and using new technology (cutting the number of human error)



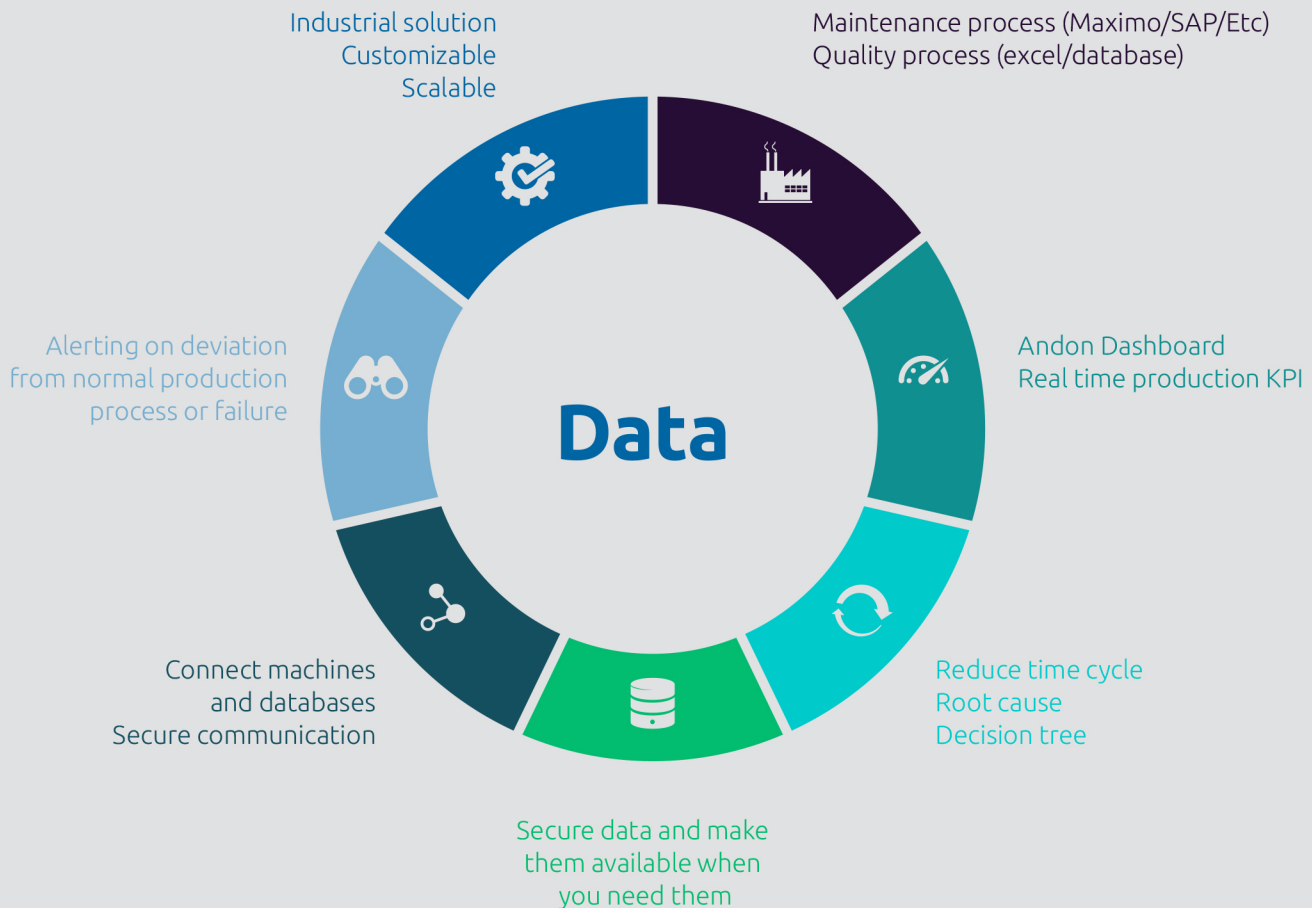
- Reduction of scrap rates, products rework, defect rates and raw materials waste (20% - 50%)
- Improvement of product quality (less deviations)
- Optimization and reduction of energy use
- Early detection of prevailing flaws in production line



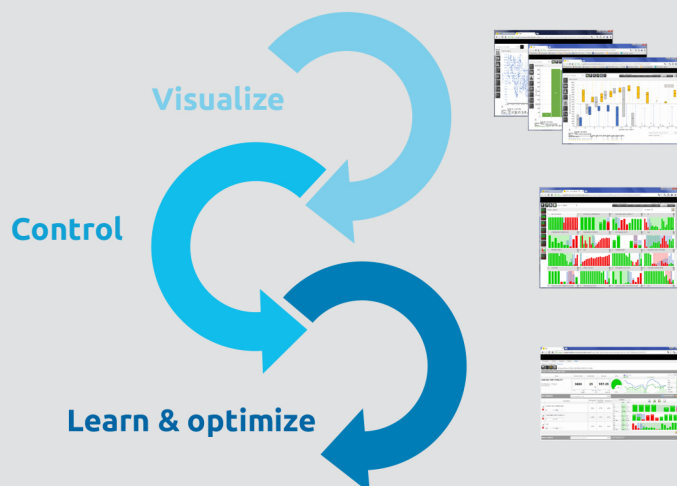
- Reduce maintenance costs (25-30%) and extra freight transportation costs
- Minimize unscheduled downtime and breakdowns (40% - 70%)
- Optimize planned maintenance (condition based servicing by monitoring key parameters instead of systematic maintenance)
- Manage business opportunities such as insourcing capacity
- Increased equipment life cycle

Manufacturing Intelligence

Data at the heart of Manufacturing Analytics



To provide actionable insights about your manufacturing processes





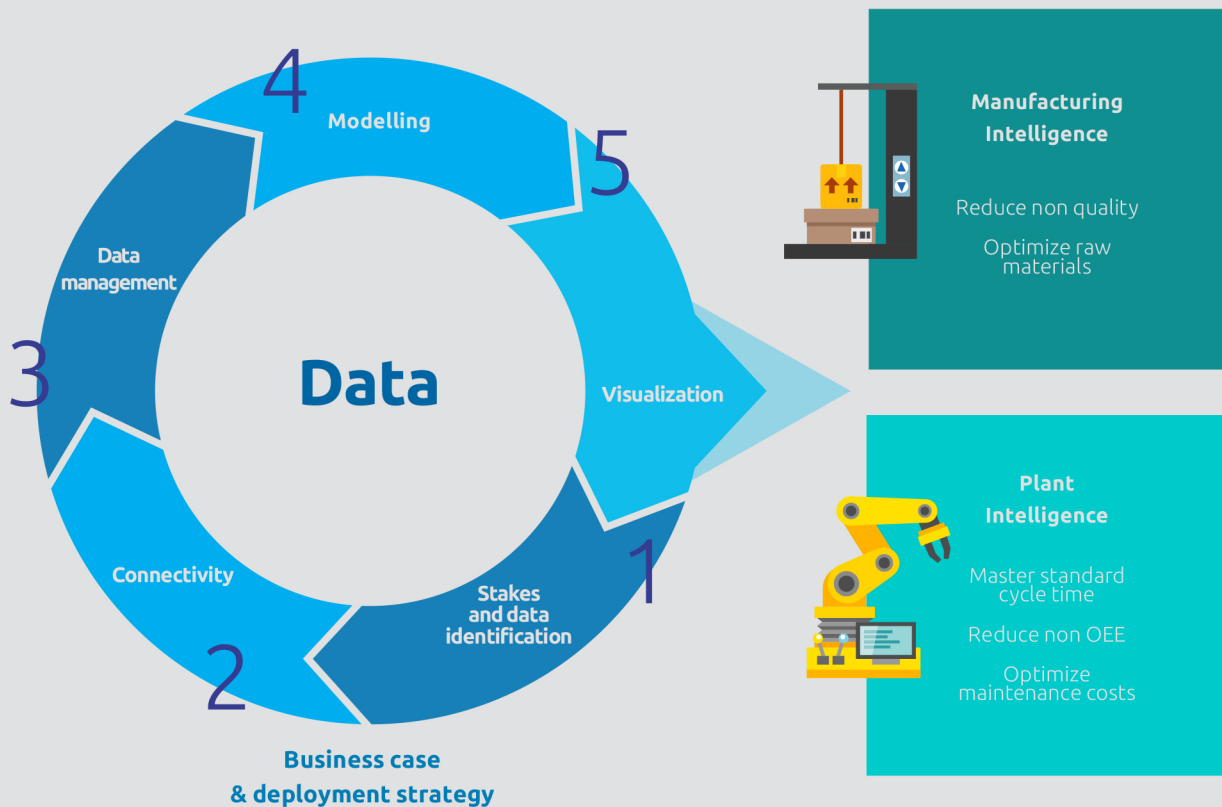
Capgemini end-to-end services

platform for industrial organizations...

We are able to extract data from all kinds of industrial equipment. By merging with other contextual data, we can provide enhanced services and drive both manufacturing process and maintenance activities improvements.

Capgemini will act as your Manufacturing Analytics partner, deploying the experience and expertise necessary to ensure these solutions fit your requirements, and bring value to your organization in the most cost-effective way, providing best-in-class services at every step of the process, from stakes identification and business case devising, to architecture design and requirements elicitation to actual optimization levers implementation.

...from stakes identification to benefits



Step 1: Clarify the needs and the relevant ROI, this stage is crucial to establishing the right project scope and define the expected outcomes for the next steps. This step also serves to assess the relevance of available data vs the intended outcomes and define which, if any; data types shall be included for processing.

Step 2: Connectivity and low-level data acquisition may be very complex issues, but thanks to our connectivity and OPC experts, IT & IIoT architects, we are able to address them efficiently. This is also where we collect and store contextual data from machines and devices, as well as process data. Relevance and impact of outcomes evolve as data sets get progressively enriched, being able to collect any relevant data is therefore key to achieving the most benefits.

Step 3: Data management contributes to the actual relevance of outcomes by cleansing data to ensure it is suitable for processing.

Step 4: Modeling helps to develop the right algorithm for resolving a given issue or a problem as identified in step 1 or, and more generally to optimize manufacturing process and product quality.

Step 5: Visualization tools and HMIs provide the means to leverage the value brought by the system and make the most of the insights provided by data analytics.

Change Management as a means for monitoring improvement:

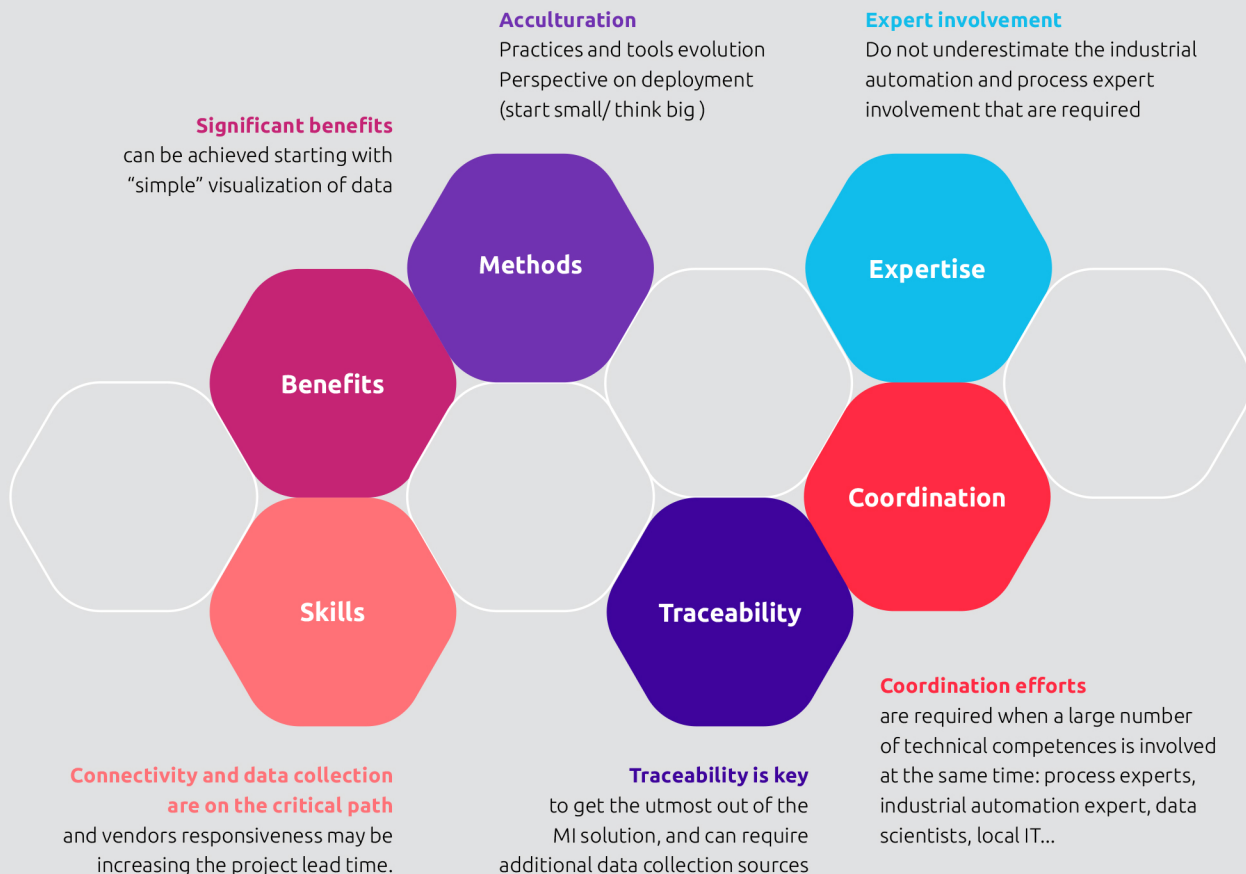
These steps can be sustained by Change Management initiative such as: explore & design, experiment & learn, implement & scale. This is how experts' network & methodologies, management of production processes, results analysis for production teams, and support for staff teams can be improved. At Capgemini, we are able to create the best strategy for scaling implementation of manufacturing analytics, from an initial and limited proof of value scope, to an enterprise wide deployment, based on lessons learnt and measured benefits.

Some significant benefits achieved after a few months within an automotive manufacturer



Our way to implement Manufacturing and Plant Intelligence

No matter how well it is visualized, no matter how sophisticated your models are, no matter how many data scientists you hire, without the proper approach, your manufacturing analytics initiative is bound to fail or, at least, deliver benefits far below expectations. Capgemini field proven approach secures your initiative by addressing all factors key to the success of your project.



Our experts respond to all your needs with the best-of-breed services and bring value to every step you may undertake.

Our strength in partnerships and solutions

Strong Manufacturing solutions have been developed with the involvement of an ecosystem of technology alliances: IBM, GE Predix, SAP, Braincube, ...

3 reasons to work

with Capgemini

1. Breadth of expertise:

Our services bring together key strengths in business consulting, technology, Internet of Things (IoT) continuity, analytics and data management services. Our strong capabilities in connectivity and data analytics are helping the industry successfully make the jump to the Digital Manufacturing.

2. Global presence:

We are a partner of choice for manufacturers with international footprint, seeking consistent quality of service, wherever they're located. Our expert's network with a strong IT foundation embracing Connectivity, Maintenance Analytics as well as industrial operations background ... enables us to deliver Manufacturing Analytics services across geographies and industries.

3. Key strengths:

We own strong transformation program design and execution capabilities. We "build and sustain momentum". Plus, our Digital Customer Experience practice offers unique insights into how manufacturers are responding to new customer expectations.

The industries

we work for



Aerospace & Defense



Energy & Utilities



Automotive & Transportation



Industry



About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of 270,000 team members in nearly 50 countries. With its strong 50 year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fuelled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2020 global revenues of \$19.3 billion.

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Note: current conversion is €1 to \$1.20 (2/17/21)