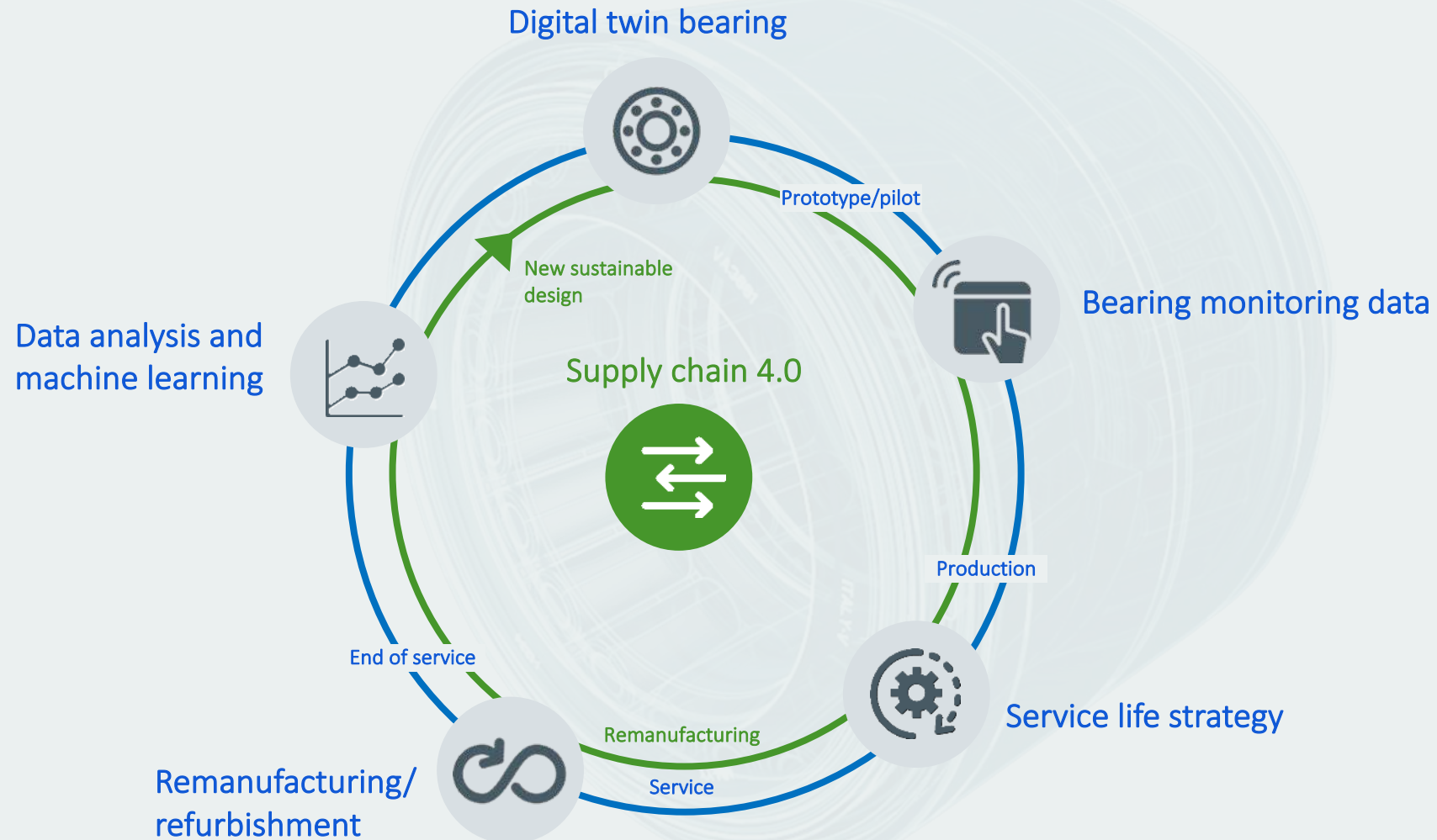




Digitalization

Power of data contribution to optimize the full life-cycle

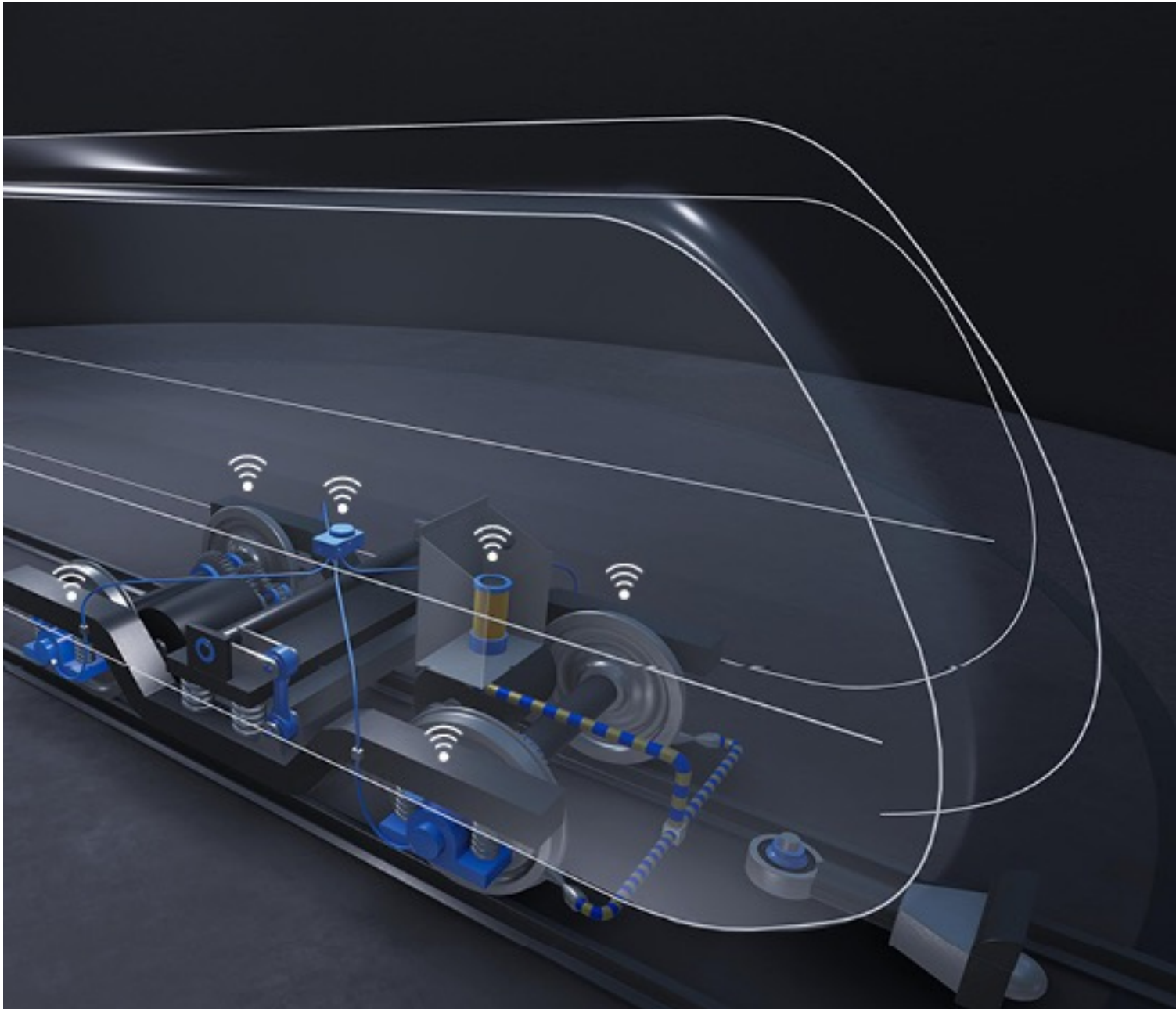
Example wheelset bearings





Changing the way we think about rail operations and maintenance

- A transformation of operations
- Opening up for new technologies
- Increasing expectations on what is possible to achieve



Enabling capacity increase and life-cycle cost reduction with data

- Increase reliability
- Extend maintenance intervals
- Lower maintenance costs
- Increase uptime
- Increase safety
- Reduce emissions



Making informed decisions puts high demands on data

Data acquisition and processing technology must provide data that is

- Reliable
- Interpreted correctly
- Made actionable



Data Matrix Code – a key element in supply chain and digital thread

- Product unique serial number assigned to each bearing
- Ensure that your product is a genuine SKF product
- Facilitate identification along the logistic chain
- Linked to digital thread of bearing data along its life cycle
- Digital thread of bearing data may include:
(Product engineering, Manufacturing traceability, Supply Chain, Application condition, Train mounting position, Bearing maintenance activities)



DIGITALIZING THE FULL
VALUE CHAIN

Building and enhancing the digital twin model **with real data** is key to achieving greater actionable insights.

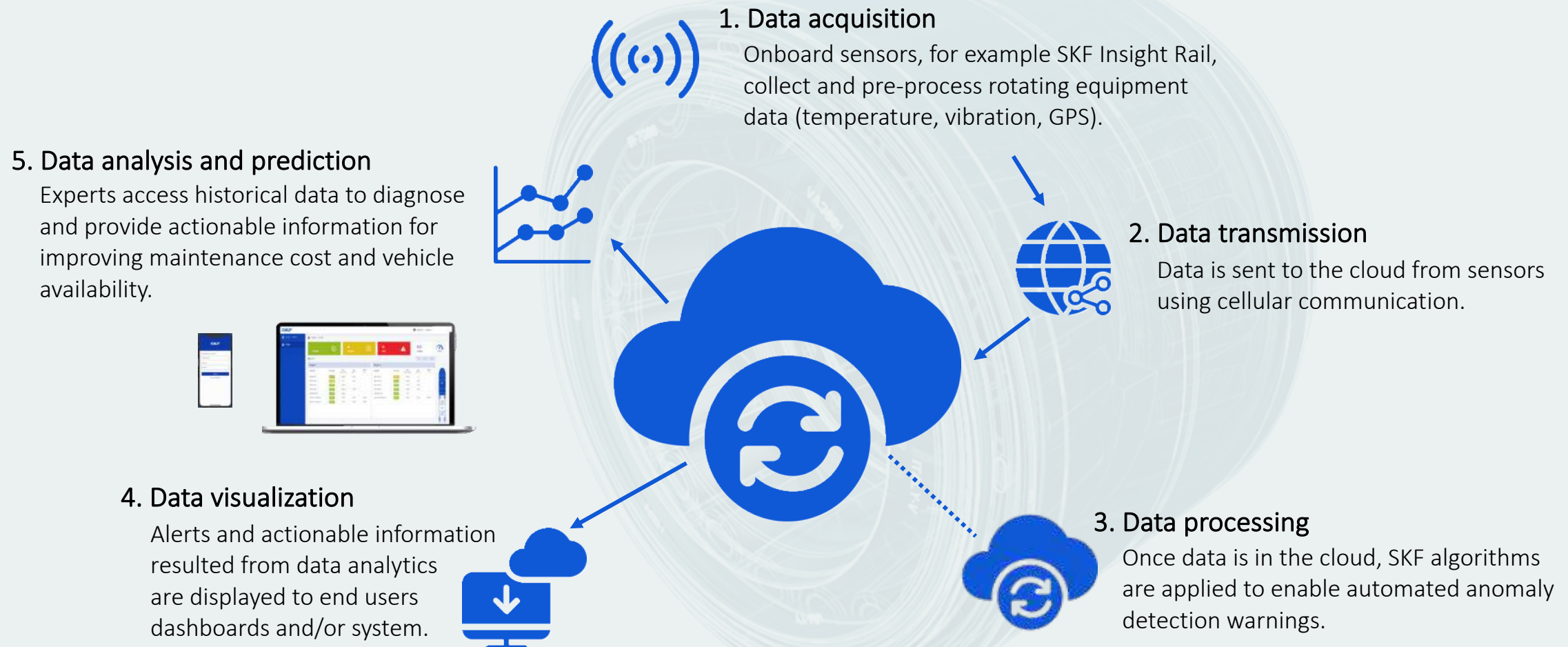


Use digital twins to take bogie maintenance to the next level

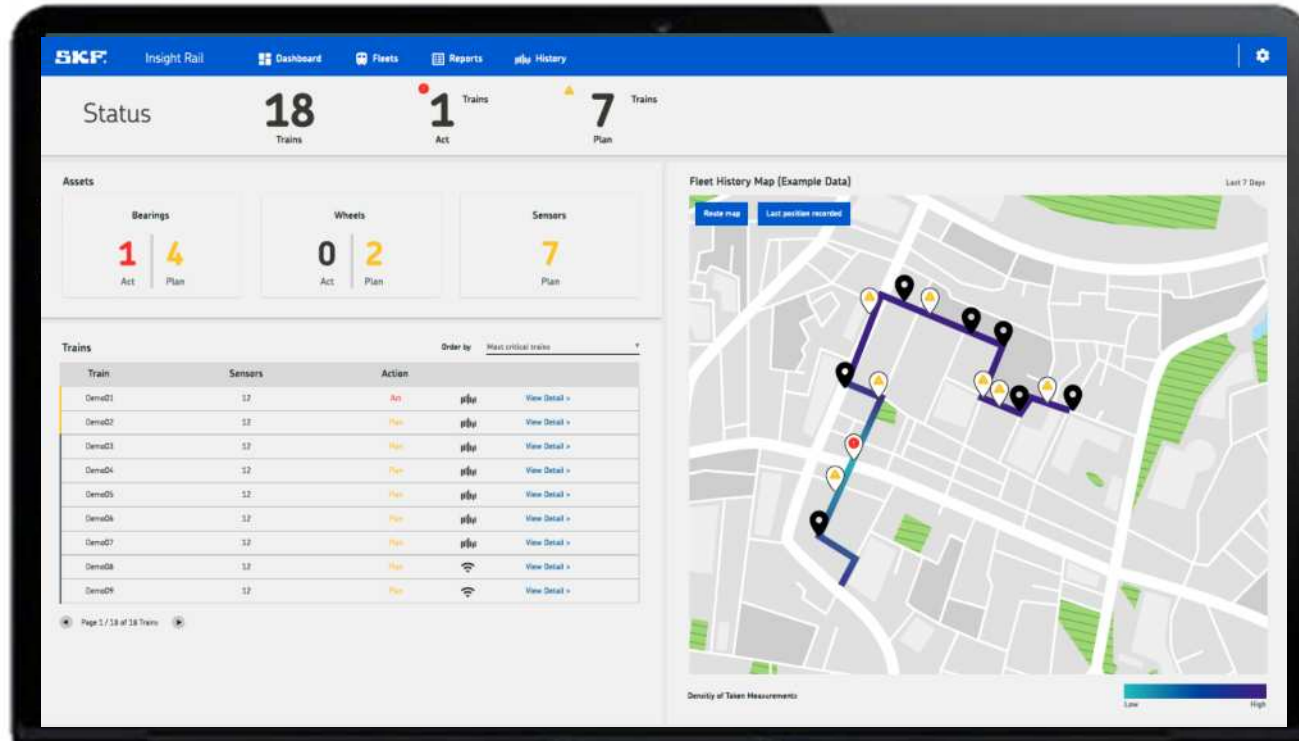
- Test design modifications digitally
- Accelerate product development
- Improve asset management of the lifecycle cost of the train



IoT railway solutions at SKF



SKF Dashboard to enable action and improvements



Fleet
availability



Maintenance
interval optimization



Carbon
footprint



Bearing
performance



Proactive supply
chain

Products and services to make it happen

On-board systems

Monitoring systems

- Quick retrofitting
- Easy adoption

Algorithms

Automatic anomaly detections for

- Rotating equipment alerts

Remote diagnostics

- Advanced services

IoT open platform

Actionable information for

- Train service scheduling
- Maintenance planning
- Operation reliability
- Dashboards

Digital services and tools

Calculation, simulation and analysis tools to enable:

- Bearing upgrades and refurbishment
- Bearing maintenance extension
- Maintenance recommendation
- Root cause definition

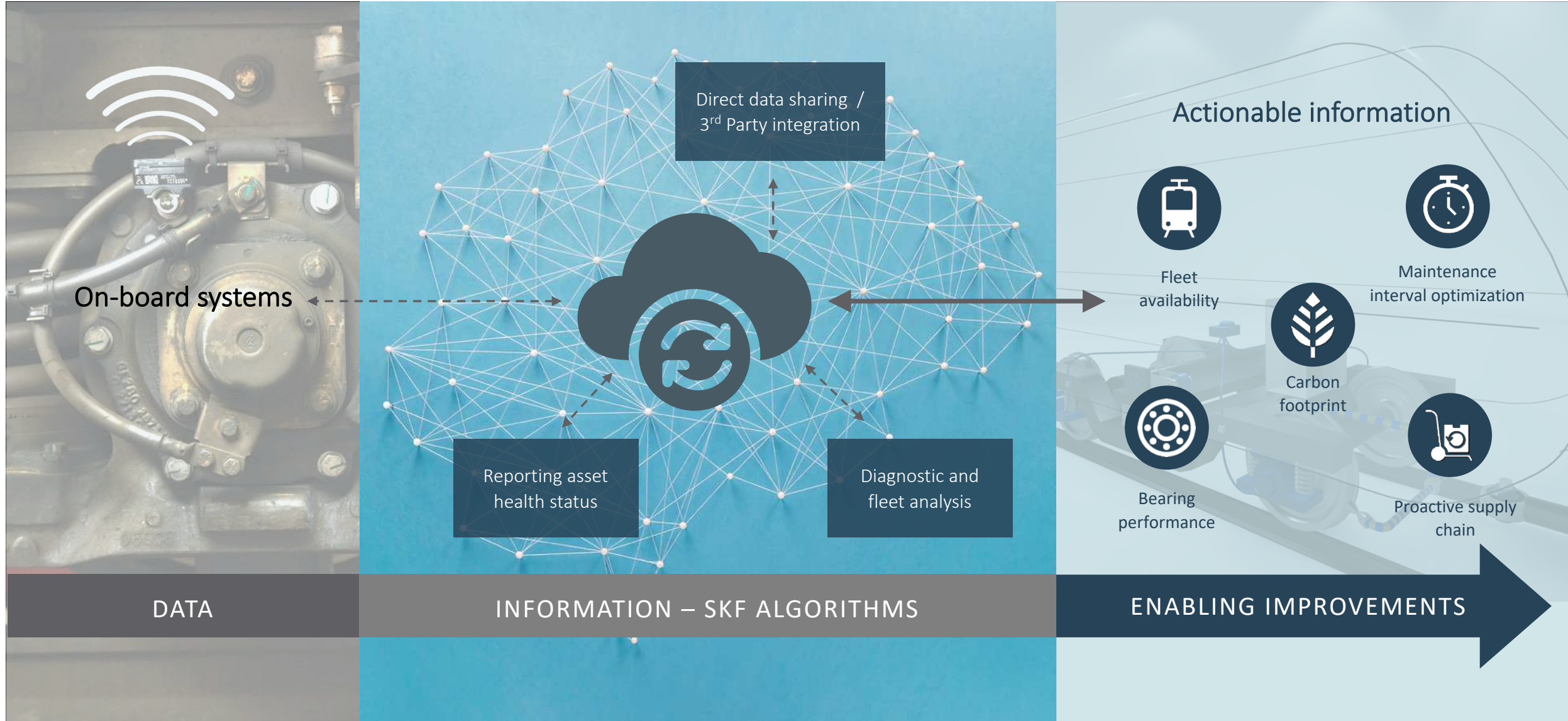
Digital bearing twin

Reports for ordering

- Forecast bearing orders
- Forecast services need

Onsite service and training

Turning data into actions



A more digital railway is driving sustainability

Digital transformation drives sustainability in four key areas:

- emission and energy control
- waste management
- sustainable production
- urban sustainability

This is done via data acquisition, for example SKF Insight Rail. The data is processed into actionable information via SKF algorithms. All this to enable improvements and make sustainable decisions.





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