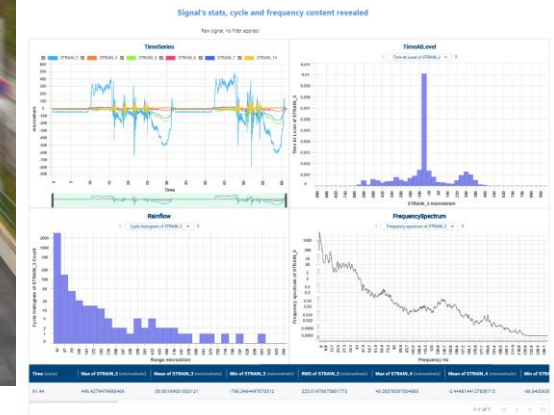
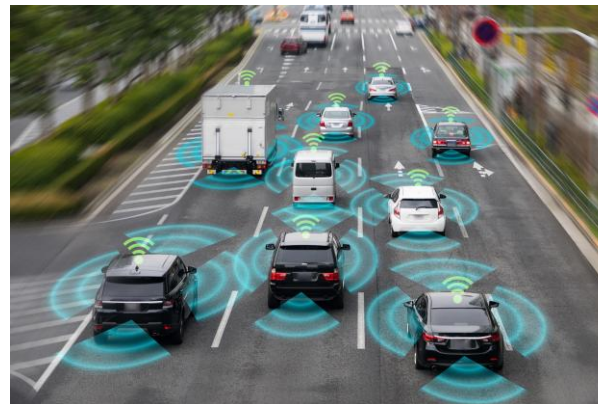


Extracting engineering insights from huge volumes of connected equipment data

HOW TO INGEST, REDUCE, AUGMENT, SUMMARIZE, SHARE, AND MAKE INFORMED DECISIONS?

Fred.Kihm@hbkworl.com

Product manager



Practicalities



Please type any questions you have into the Q&A chat box.



Today's presentation will be e-mailed to you



This webinar will be recorded

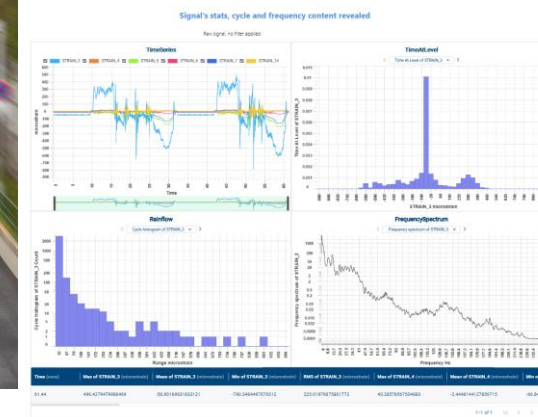
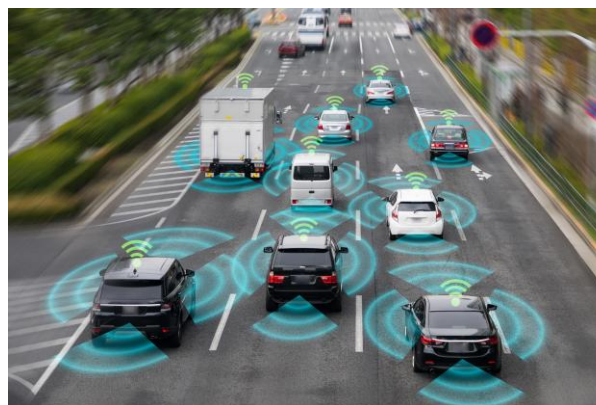


For any additional questions,
feel free to contact us at:
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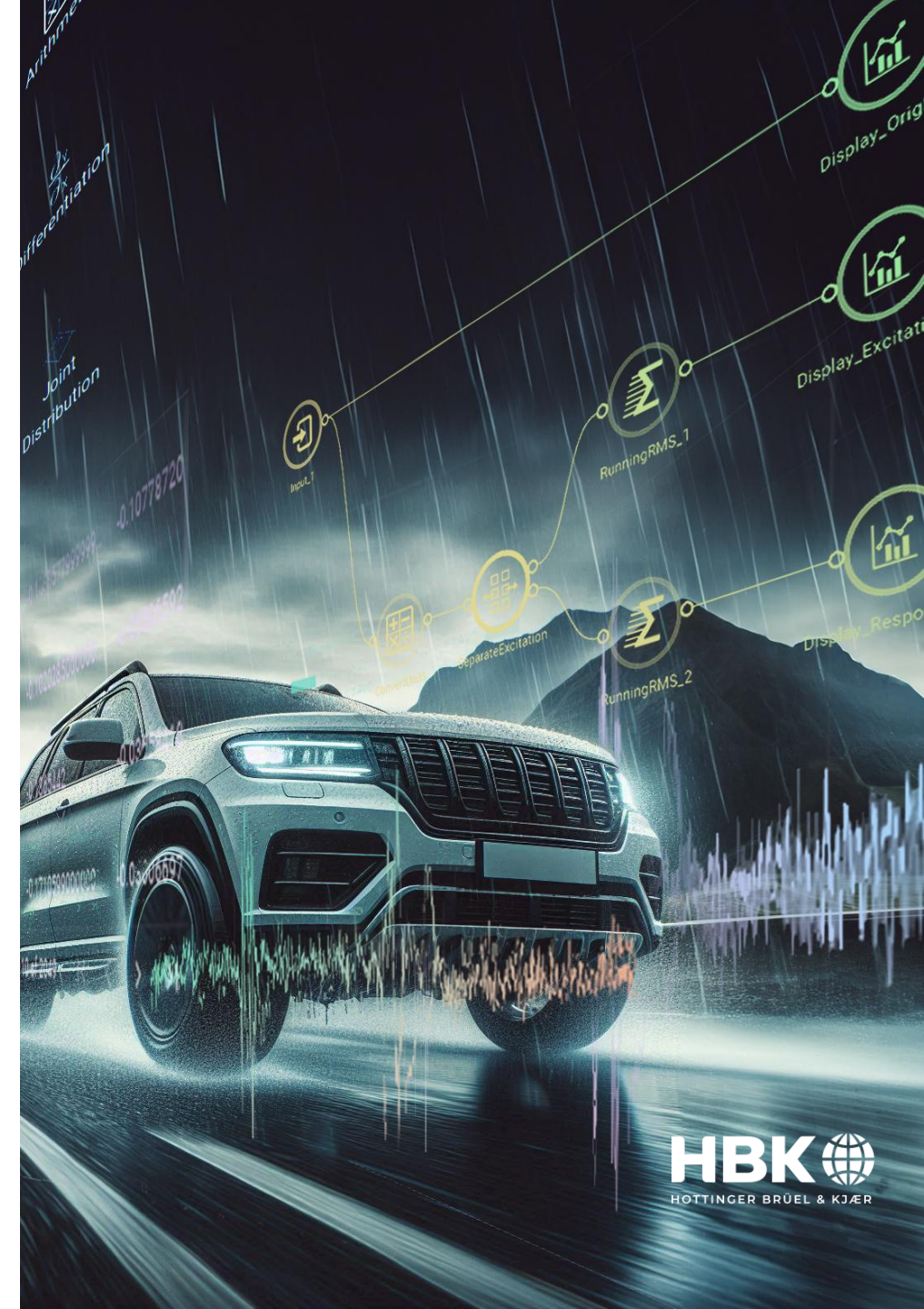
Product manager

Data, data everywhere...

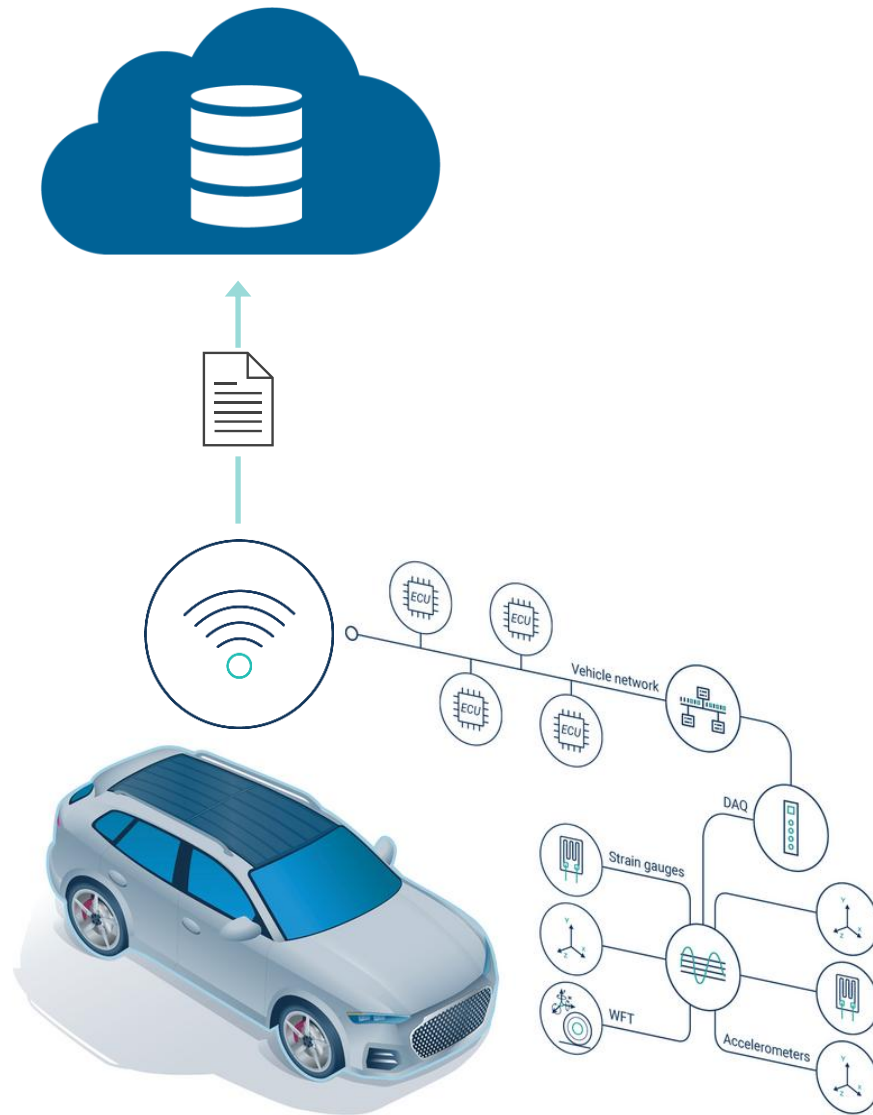
Large quantities of:



- Increased volume, velocity, and variety of data
 - High quality data acquisition recordings
 - Time stamped CAN bus data
 - Data lakes of connected sensor measurements
- Collecting data is relatively easy but getting the value from all this data is much harder.



Data lakes



- Automotive OEMs have millions of connected customer vehicles.
- Instrumented test vehicles can also be connected.
- Easy to store large volumes of data in the cloud.
- Increasingly common is storage as Parquet files in data lakes.
- But the volume is huge...

How do you get insights from all this data and avoid a data lake becoming a data landfill?

Why is solving this data problem important?

- ▲ Understand customer usage to optimize designs.
- ▲ Validating ADAS and autonomous vehicles.
- ▲ Improving and validating sustainability / emissions goals.
- ▲ Improve maintenance with predictive maintenance models



Advantage Insights & Aqira

 **Big Data
Server
Processing**

 **Aqira**



Web-based access



Test data management - share the data, deploy standard analyses



Run server-side – large scale, automate

Globalize



Experts to build processes using engineering functionality.



Explore design space, trade-offs, what-if scenarios.



Need for interactivity, flexibility, with local data.

Analyze



**Data
Sources**



Lab & Test Measurements

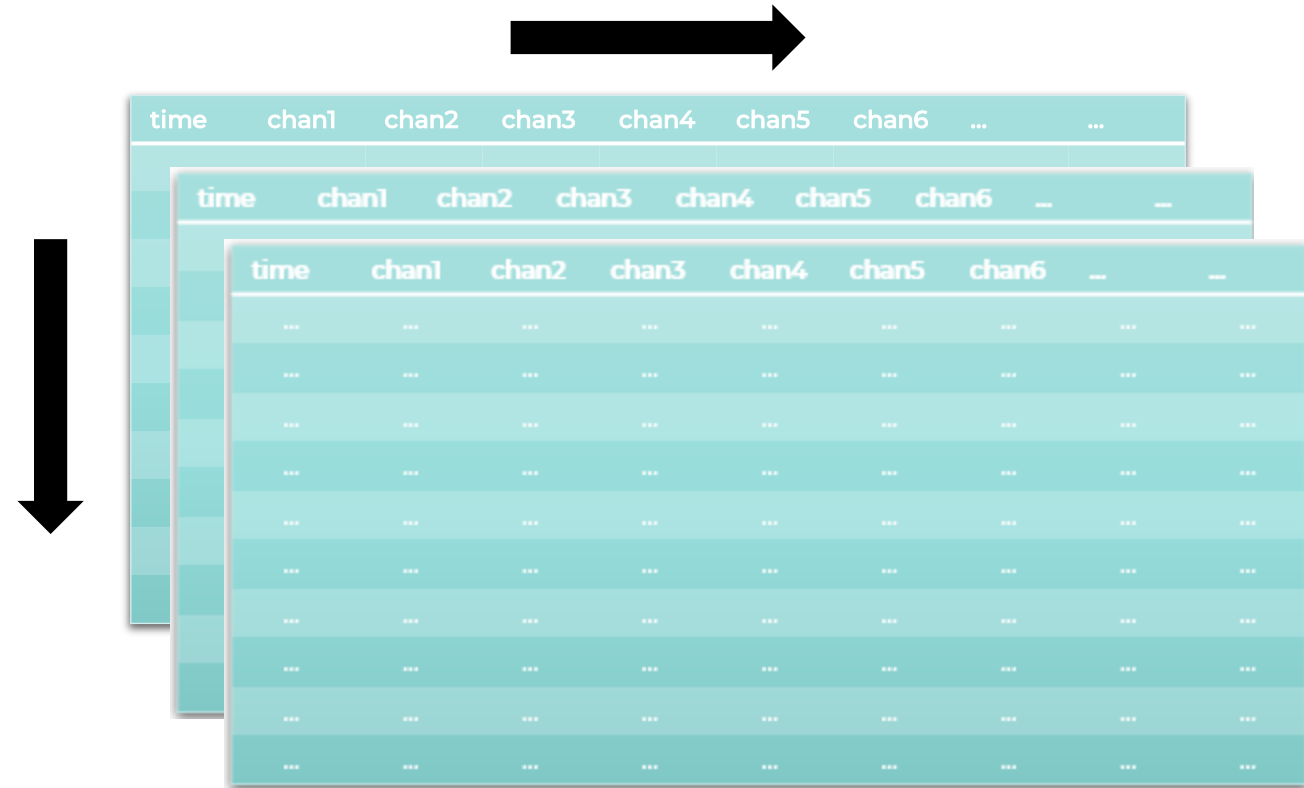


Connected Equipment

Measure

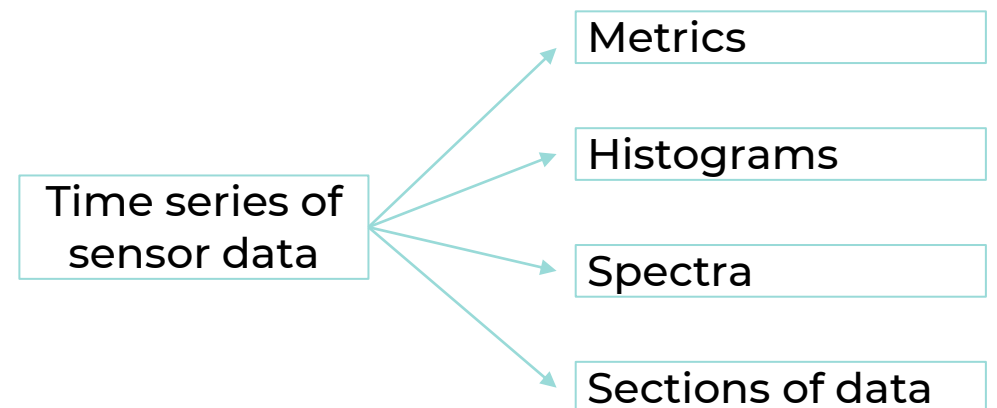
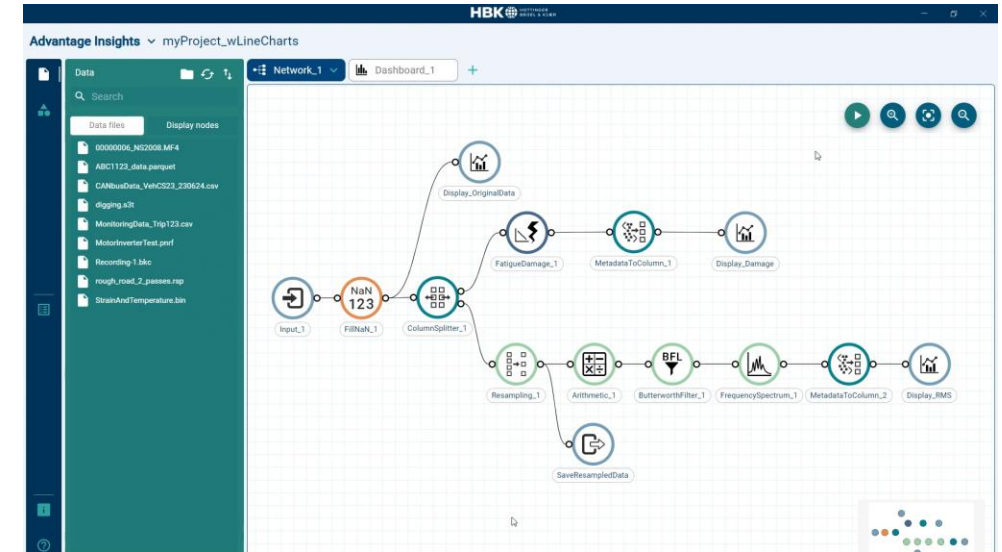
What do we call huge volumes of data?

- Engineers can be overloaded with data files, due to :
 - Large number of points,
 - Large number of channels,
 - Large number of files.
- With Advantage Insights you can:
 - Visualize a table of details to understand size, content, etc.
 - Focus just on the data you need, to make the analysis simpler and quicker.
 - Reduce the data to e.g. meaningful histograms,
 - Enrich the data with stats & metrics



What do we mean by engineering insights?

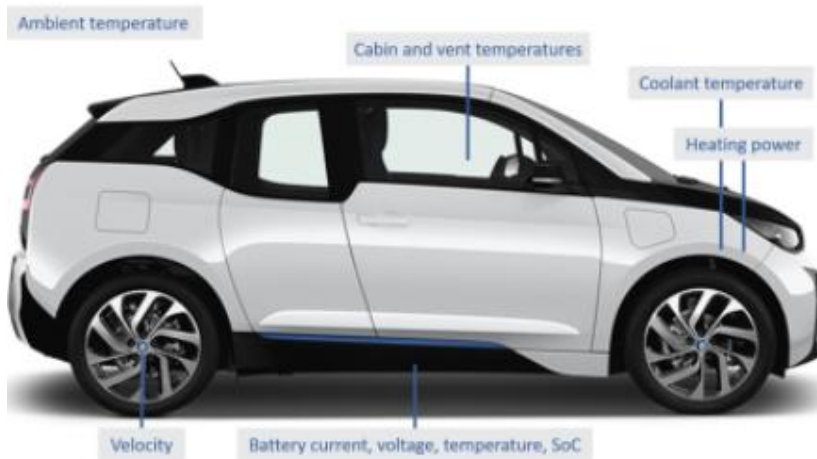
- ▲ “Data Analytics”, often means SQL-based analytics, mostly for market trends, business intelligence, webpage stats.
- ▲ Advantage Insights applies engineering analyses to time series of sensor data.
- ▲ Processing capabilities include:
 - **Signal Processing:** digital filters, FFT, resampling, extraction.
 - **Anomalies:** limit detection, spike detection.
 - **Statistics:** global and running statistics, probability density, counting histograms, joint distributions.
 - **Fatigue Analysis:** rainflow cycle count, relative damage.
 - **Customisation:** Data Frame Connector node (Pandas).
- ▲ File formats supported:
 - DAQ systems: S3T, BKC, PNRF, BIN, DXD, RSP/RPC, etc.
 - CAN data loggers: **MDF4** (messages and signals) and **CSV**.
 - Big Data : **Parquet** (via Pandas)



Demo

Data from: <https://iee-dataport.org/open-access/battery-and-heating-data-real-driving-cycles>

⌚ Battery and Heating Data in Real Driving Cycles



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Last updated: Mon, 10/19/2020 - 11:01

DOI: [10.21227/6jr9-5235](https://doi.org/10.21227/6jr9-5235)

Data Format: .csv

 20153 views

 9036 downloads

 3 citations

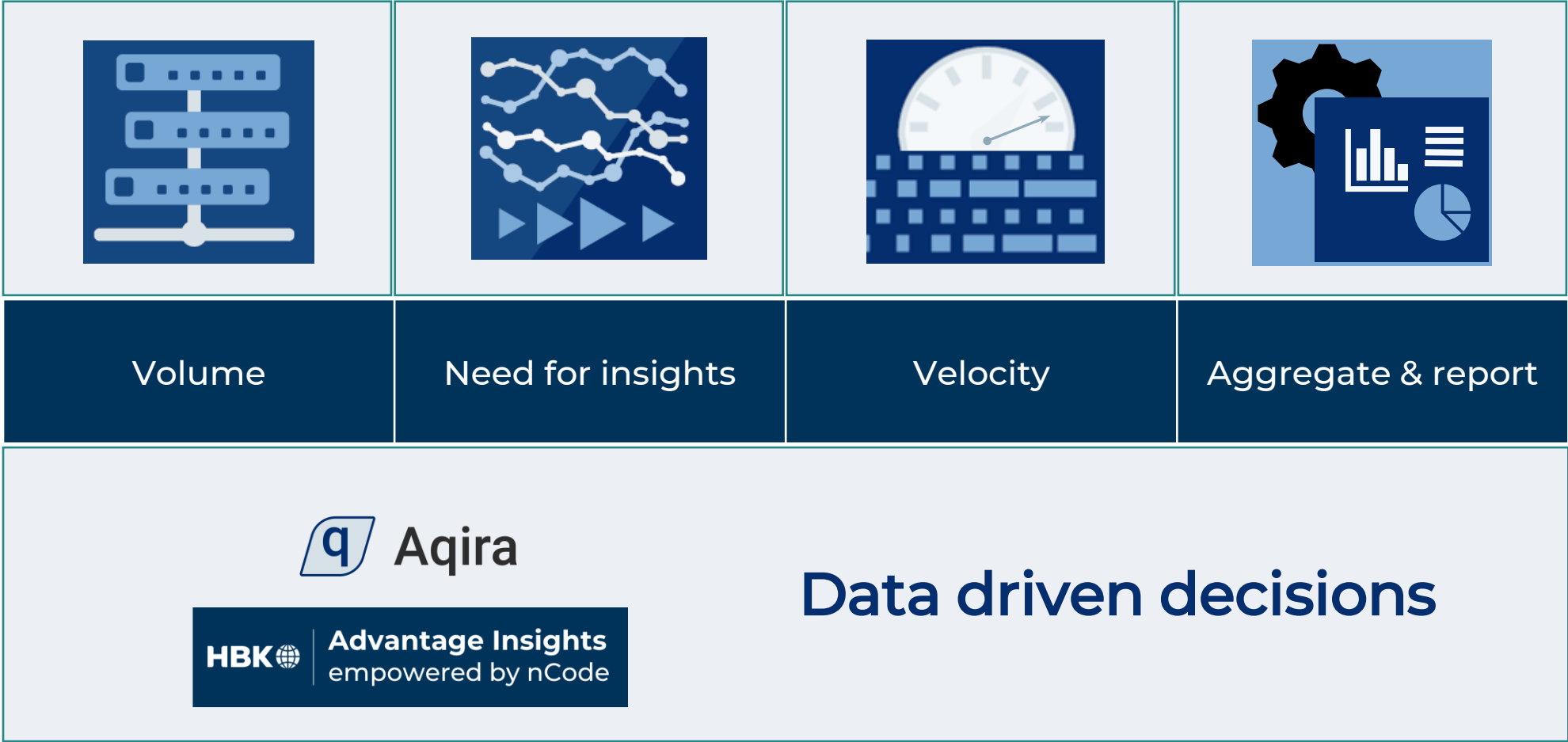
Categories: [Transportation](#)
[Power and Energy](#)

Keywords: [Driving cycle](#), [battery data](#),
[regenerative braking](#), [peak power shaving](#)

Conclusion

- ▲ Collecting data is relatively easy but getting the value from huge volumes of data is much harder.
- ▲ Extracting insights from real-usage data is key to improve designs and validate models.
- ▲ HBK products **Advantage Insights** and **Aqira** can help with:
 - Extracting engineering insights from sensor data.
 - Deploying at a larger scale to enable data-driven decision making.

Summary



Thank you

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Resources & What's Next

1 Visit us to learn more about Advantage Insights:

<https://www.hbkworld.com/en/products/software/durability/advantage-insights>

2 New video series - Advantage Insights Unlocked:

Recent update – Histograms!

<https://www.hbkworld.com/en/knowledge/resource-center/articles/advantage-insights-unlocked-histograms>

Next update: September / October

3 Upcoming new release - Advantage Insights 2025 R3

Main new feature : Channel Picker to focus on specific sensors

Scheduled end of July - stay tuned!

4 Upcoming event:

HBK Technology Days 2025!!

04, 11, and 18 November

6 sessions of 90 minutes each - online

This years' themes will be fatigue crack growth, fatigue at elevated temperature, reliability data models and probabilistic fatigue, and fatigue and reliability monitoring. With applications in nCode GlyphWorks, DesignLife and Aqira, and ReliaSoft Weibull++ software products. More details to come!



Questions?

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