

HBK – Hottinger Brüel & Kjær

FROM DATA CHAOS TO CLARITY: UNLOCKING THE FULL POWER OF NCODE WITH AQIRA

Chris Phillips: Product Manager – Aqira

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: info@hbkworld.com



Welcome to today's session

From Data Chaos to Clarity: Unlocking the Full Power of nCode with Aqira

Look at how we can maximise the value of existing nCode tools by using HBK Aqira.

- Look at where we are now – what works well, and what common problems & opportunities can we recognise.
- Introduction to HBK Aqira. Revisit the earlier problems, look at how Aqira can solve them
- Look at the value that can be obtained by using Aqira as a value multiplier for our data and our processes – in both the engineering and IT domains.



Introduction of Chris Phillips

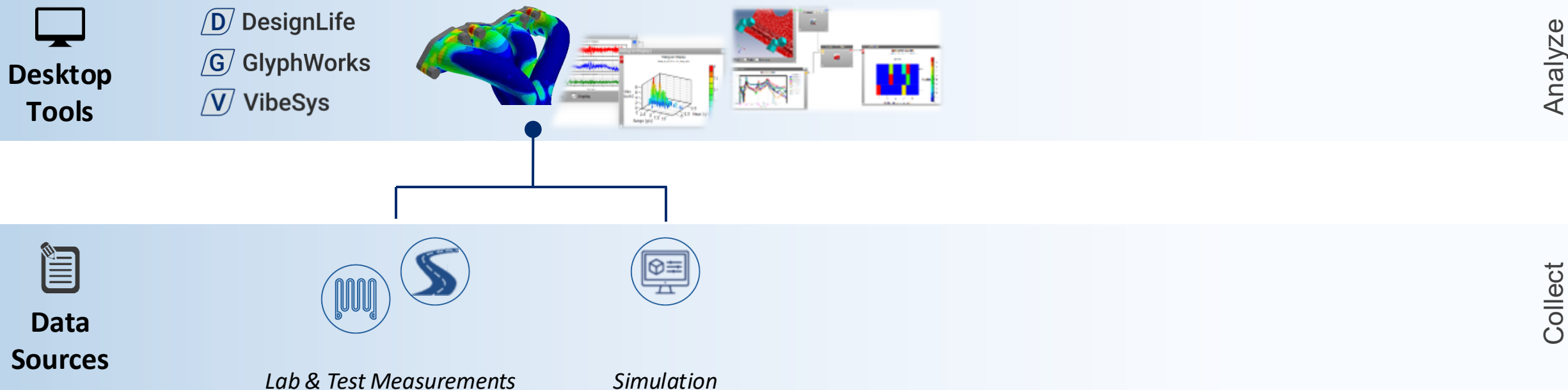
- ▲ MEng in Electronic Engineering from University of Sheffield
- ▲ Product Manager with HBK for 6+ years
- ▲ Previously:
 - Product Manager at Balfour Beatty Rail Technologies monitoring railway signalling systems
 - Software Engineer on engineering and business software for rail.
 - Embedded Systems Engineer on Harrier Ground Crew Training Simulator
- ▲ Enjoys bouldering, board gaming

The Problem: Defining Chaos

The world as we know it

Specifically considering nCode tools (but similar for other tools):

- Test Data:
 - captured via both HBK and other DAQ / Sensor solutions. nCode can process a wide range of common test data file types
 - stored – on local machine; in network file store/s
- Tools: nCode (GlyphWorks, DesignLife, VibeSys) or Advantage Insights installed on desktop.
 - Extensive set of engineering tools (Signal Processing, Durability, Fatigue, Vibration) . Subset of nCode packages available to users
 - Licensing Method (token-based, purchase outright)
- Flows / Networks: created by tools are stored locally and shared manually via corporate network



Modern Product Engineering Challenges

The Trends:

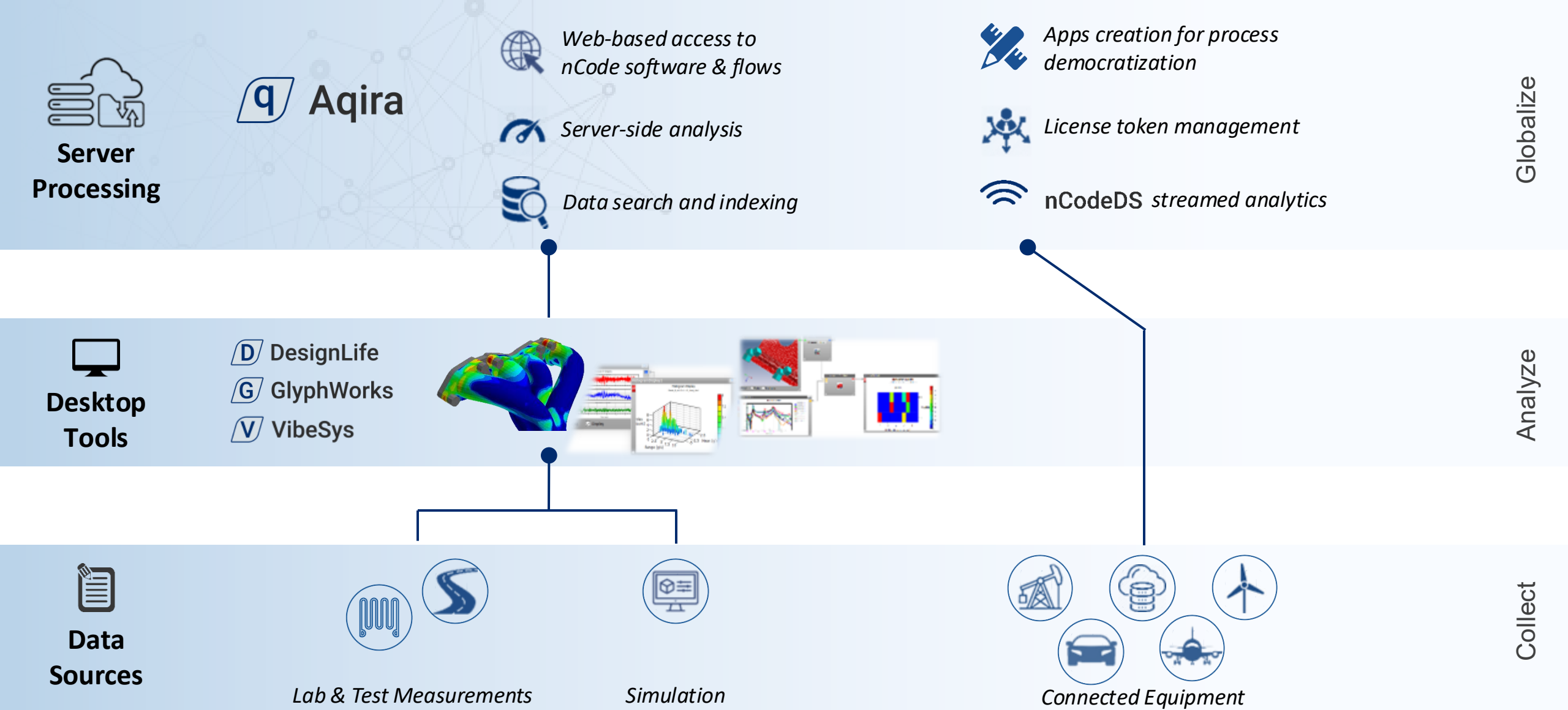
- More Sensors and Connectivity mean increased data volumes
 - 2010-> 2025: Estimated Global Datasphere has grown from estimated 2 Zettabytes of data to 175-200 Zettabytes (1 Zettabyte = 10^{21} Bytes; 10^9 TB)
- Product Teams are more remote / geographically distributed
- Product Teams have less engineering resource
- Increased complexity of IT systems / standards

The Challenges:

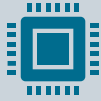
- Expectation of quicker and better decisions / insights
 - Hard to achieve quicker insights with more data and the same tools.
 - Engineer's time spent finding data rather than adding value
 - Limited availability of experts
- Loss of organisational and domain knowledge
 - Engineers leaving can result in loss of many years of experience
 - New engineers take time to learn tools and data
 - Systems are often not in place to manage organizational knowledge
 - Non-standard processes, Outdated processes, Duplication of effort
- IT Resources as a bottleneck for process improvements



The Solution: Managing Chaos



How can Aqira support productivity



HBK Aqira centralizes engineering data access and tools to make these even more valuable



Data Access

Central location for data access allows engineers to focus on **what** not **where** data is.
Tools to allow data discovery across network are a significant time saving



Democratisation

Capture and share expert knowledge using powerful analytics tools such as nCode / nCodeDS
Central management of analytics tools ensures **the right people have access to the correct versions**



Process Automation

Run workflows automatically so **data** is made available and discoverable **as soon as possible**
Scale out resources to **support larger workloads**

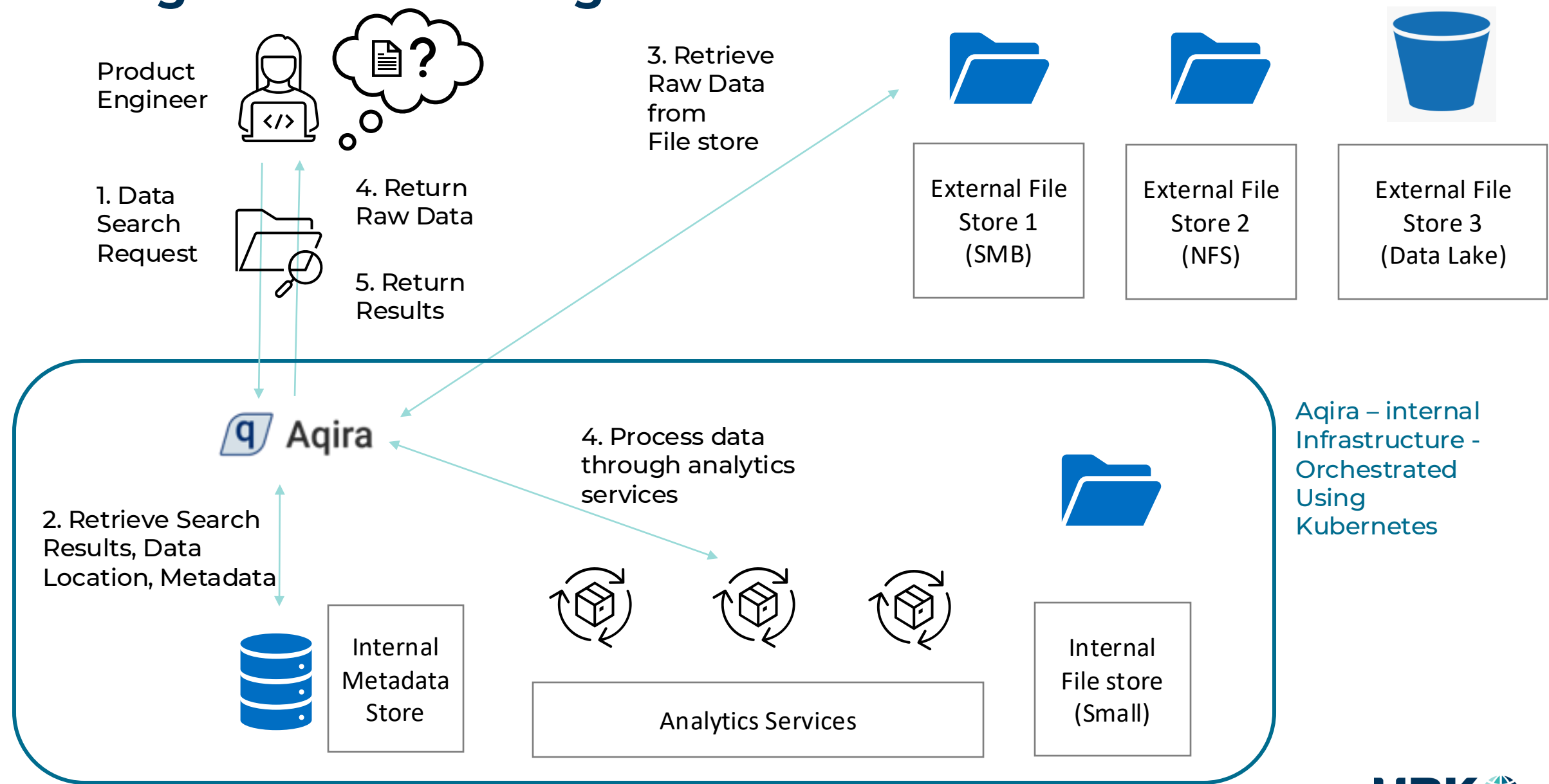
Key Data Management Needs

Engineers in the test / product design space need:

- ▲ Capability to share data across company through a single access point.
 - Break down siloed data and address unstructured data issue.
 - This data needs a clear, defined structure so that discovery, validation, and security are easy.
- ▲ A system that works for Time Series Test Data
 - Searchable at test / channel level
 - Able to store both object metadata and calculated metadata



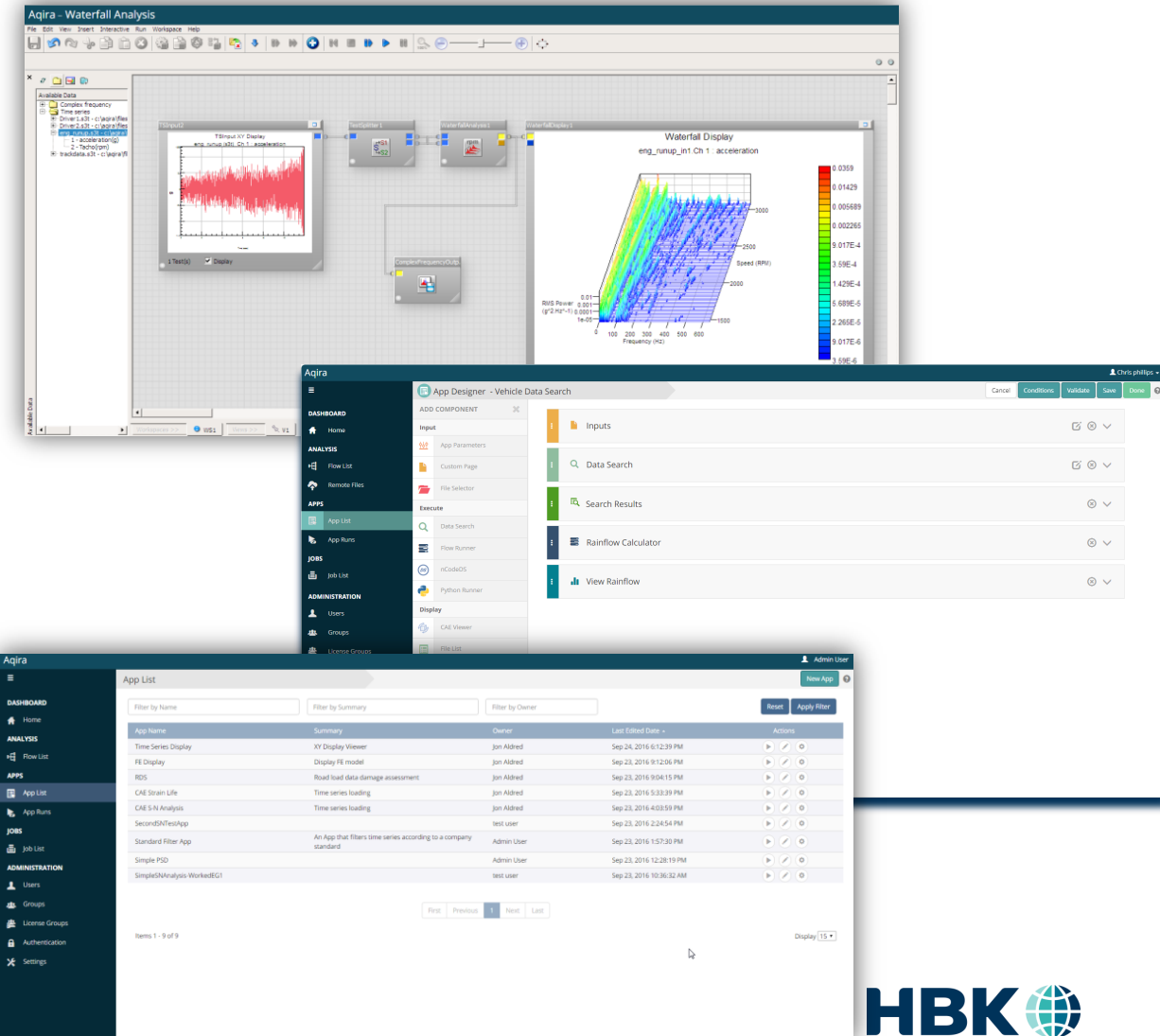
Solving the Data Management Problem



Aqira: Analysis, Apps and the App Framework

What is an App?

- Encapsulates an **engineering process**
 - Ingesting Data, Finding Data, Analyzing Data
 - Or a Combination
- Created** with user-defined web interface. Built from prebuilt configurable components
- Data and control parameters** passed between components
- Simple front end** to make process accessible
- Manage and shared with users based on **roles and role groups**.
- Run as server-based analysis for **scalable** execution



Democratizing Expert Knowledge

The screenshot displays the Aqira software interface, which is a web-based tool for data analysis. The main workspace shows a workflow diagram with three components: 'TSInput1', 'Rainflow1', and 'HistogramOutput1'. The 'Rainflow1' component is highlighted, and its properties are shown in a dialog box.

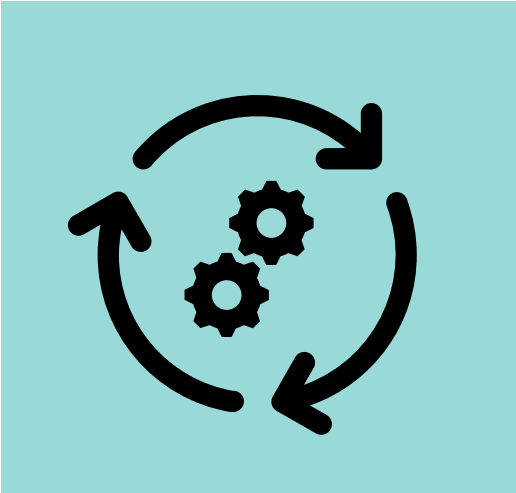
Rainflow Properties

Name	Value	Description
General		
Method	Rainflow	Specifies the counting method.
HistogramType	RangeMean	Specifies the type of histogram to create
CloseResiduals	True	Determines whether residual turning points are closed down at t
BinResolutionOnly	False	Bin data prior to performing rainflow
Gate		
Gate	0	Cycles whose range is less than the gate are discarded.
GateUnits	Percent	Sets the units of the gate value.
RangeMeanSizing		
HistogramSizingX	Auto	Specifies how to define the X-axis limits
HistogramSizingY	Auto	Specifies how to define the Y-axis limits
XLimitsAuto		
NumberOfXBins	64	Sets the number of bins on the X axis in the output histogram
YLimitsAuto		
NumberOfYBins	64	Sets the number of bins on the Y axis in the output histogram

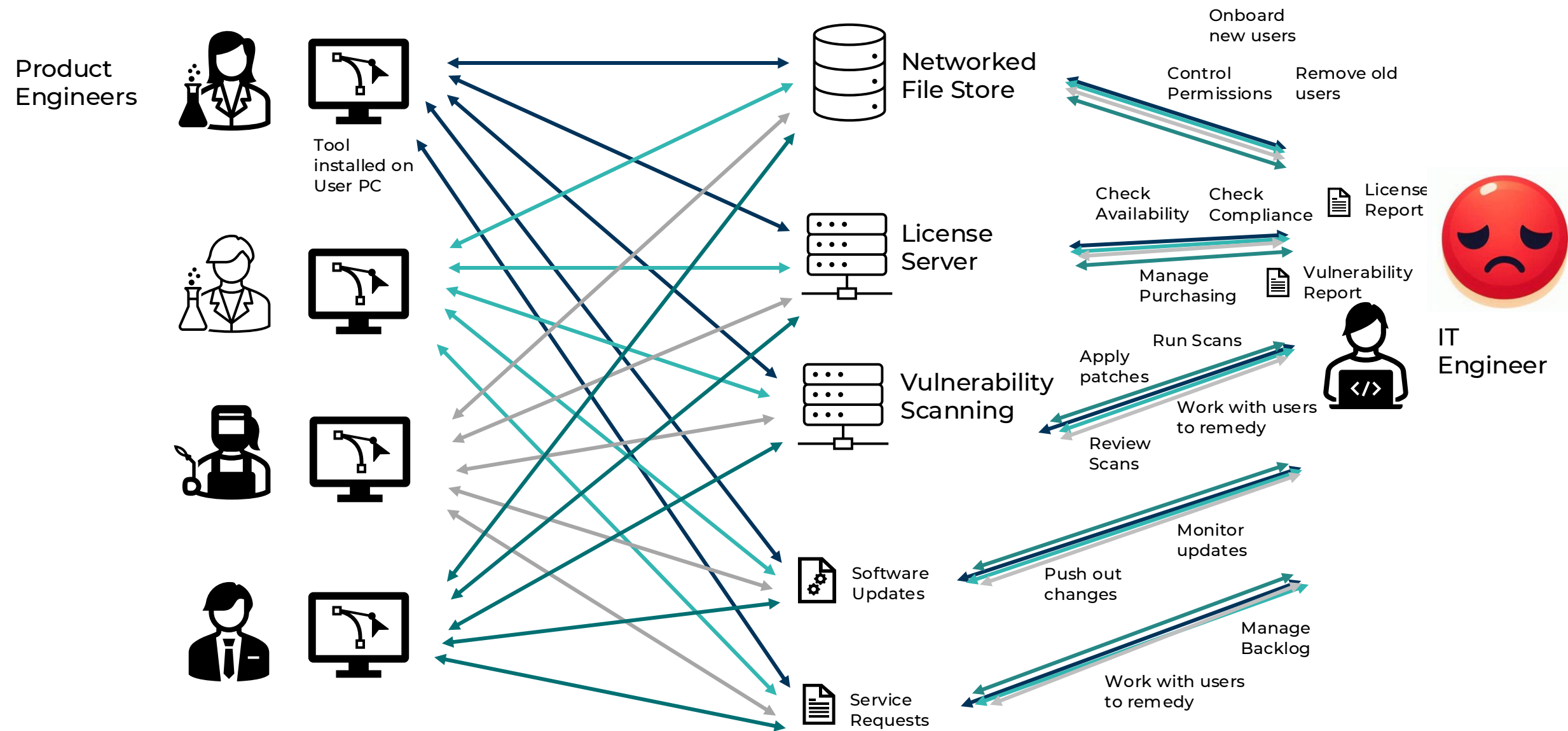
The 'GlyphWorks' palette on the right side of the interface lists various analysis functions, including:

- Input
- Function
- Basic DSP
- Amplitude Distribution
- Arithmetic
- Butterworth Filter
- Concatenation
- Curve Fitting
- Differentiation
- Electric Power
- Extraction
- Fast Fourier Filter
- Frequency Spectrum
- Signal
- VibeSys
- DesignLife
- Fatigue
- Vibration Profile Design
- Optimized Testing
- GlyphBuilder
- SuperGlyph
- Display
- Output

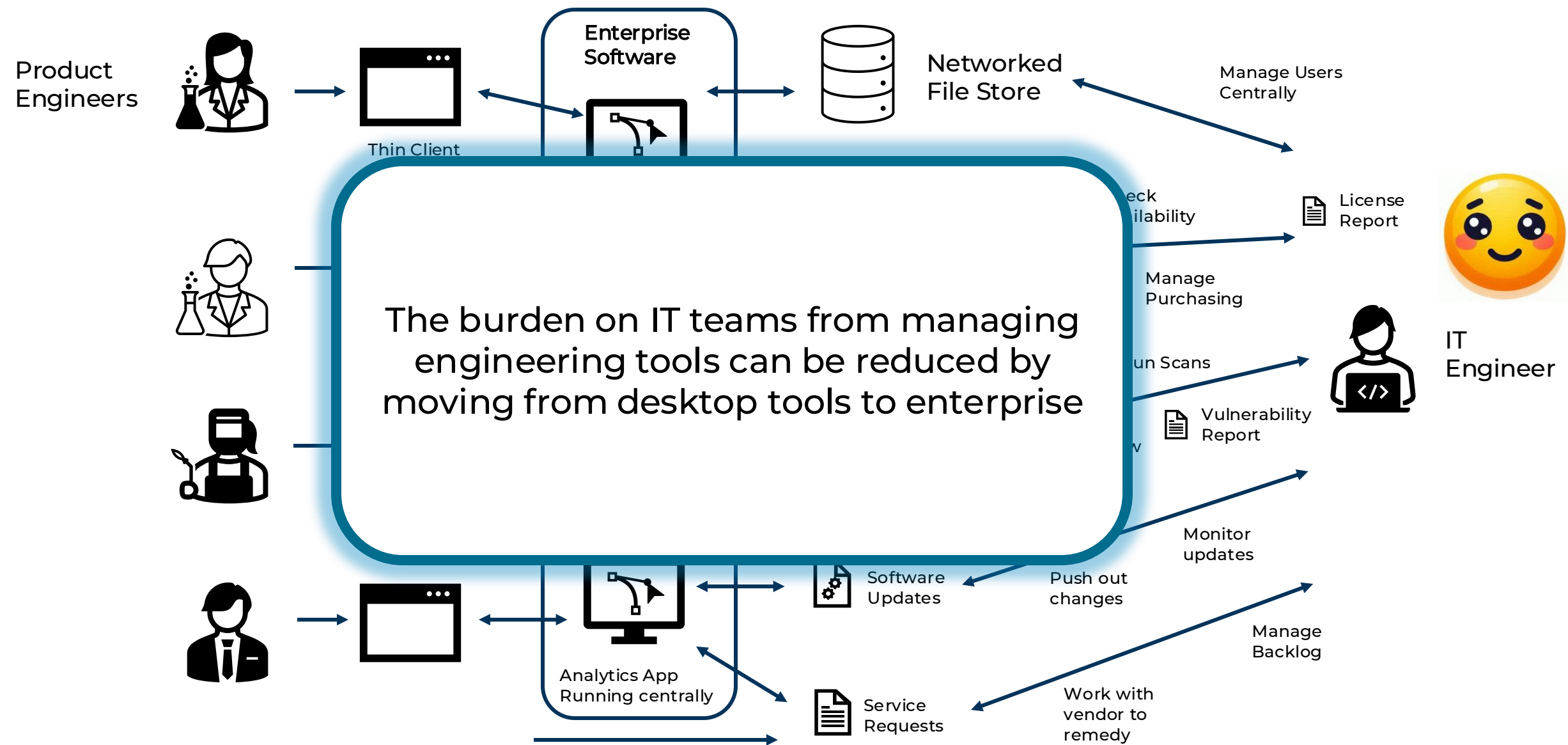
Demo



IT Burden of desktop software



IT Burden of desktop software



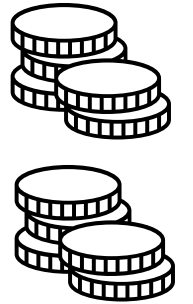
Maximising Value

The Value of Data

Return on data investment =

Value extractable from data

- *Cost of doing the test*
- *Cost of doing the analysis*
- *Cost of engineer time to find data*
- *Cost of re-doing the test*



Value Extractable from data:

- Data Quality / Analysis Quality
- Timeliness of Insights

Cost of doing the physical test

- Can we do a better test? Tools to improve tests

Cost of doing the analysis

- Creating the analysis (Engineering expertise)
- Time taken to find the right analysis
- Repeating an analysis / Automating an analysis

Cost of engineer time to find data /
Cost of re-doing test when data lost

- Anecdotal – up to 50% of engineer time spent finding data
- Availability through single portal / search mechanism
- Automate ingestion / Pre-processing / Quality Activities

Some Additional Thoughts on Value, Tokens and Scaling

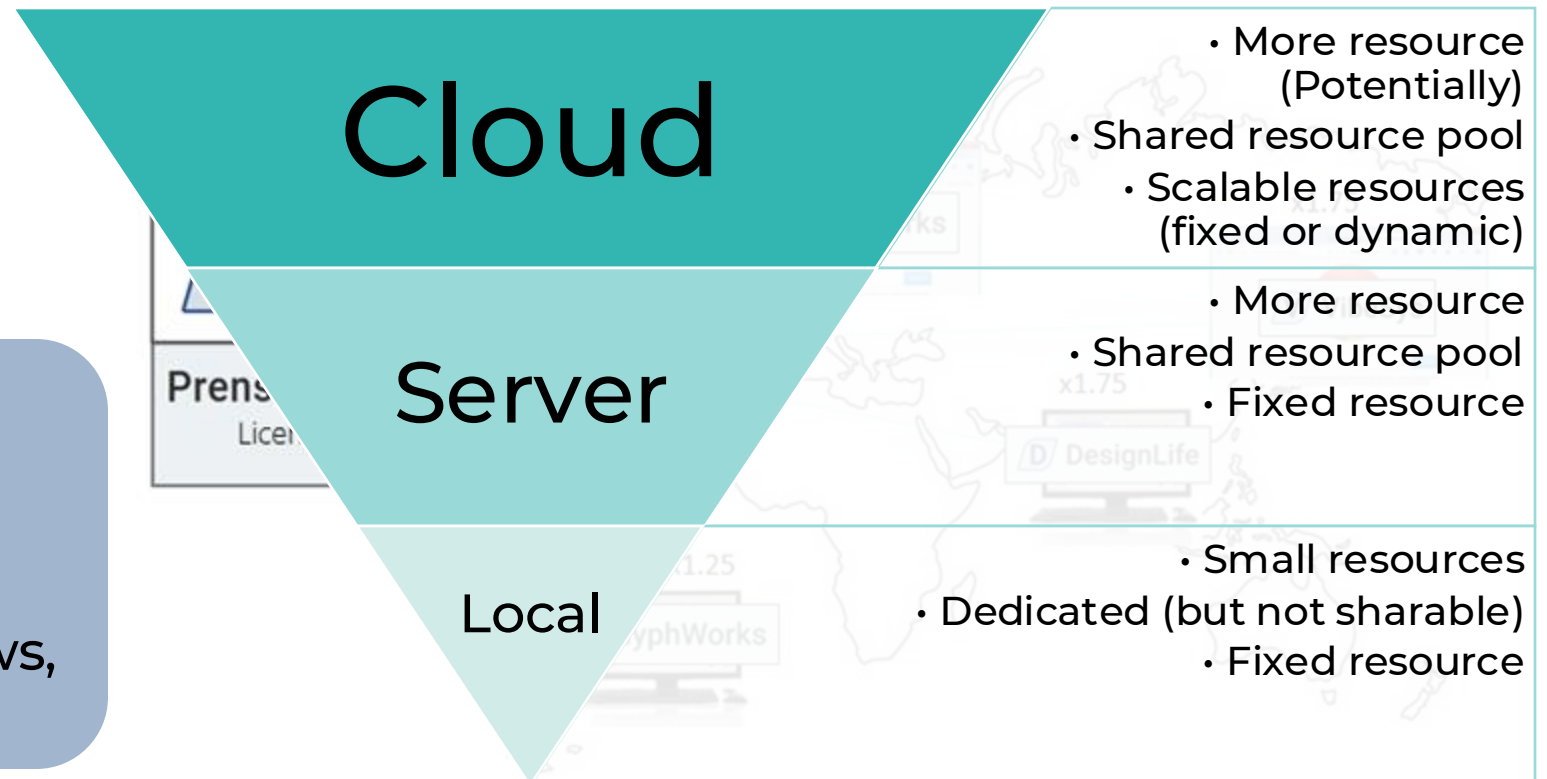
▲ Tokens are an effective way to buy software

- Buying functionality vs Buying flexibility
- Functional flexibility – all nCode packages are available
- Geographical flexibility - same tokens, different time zones

▲ Scaling of resources

- Local resources
- Server based resources
- Cloud based resources

Combining tokens and centralised processing resource lets us get greater value from existing investments – e.g. tools, flows, training.



Summary

- ▲ Existing desktop tools bring a lot of power to product engineering process, but don't address key workflow questions:
 - Getting faster to-market with fewer engineers
 - Increasing Data Volumes
 - Siloed access to data and tools

- ▲ Aqira provides capabilities to address key areas:
 - Standardisation: Simple creation and managed sharing of analysis tools
 - Democratisation: Capture and share expert knowledge. Make high value test data easy to find
 - Digitalisation: Support for remote working. Automate data availability. Reduced IT burden

- ▲ Value gained:
 - Reduced time finding data allows expert engineers to produce more valuable insights
 - Common process workflow and shared controlled tools reduce inconsistencies and rework
 - Multiply value from existing investments in software, tokens, and training

Resources & What's Next

1

Visit us to learn more about Aqira:

<https://www.hbkworld.com/en/products/software/test-data-management/aqira>

2

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!

www.hbkworld.com/technologydays2025

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Aqira 2025.1.0 coming October 2025

Featuring Data Catalog for data exploration, and Metadata Access Control to improve ability to secure access to your data.

Thank you. Questions?

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