

# Taking Machine Learning to the next stage with Guided Analytics

World first demonstrator support by SolutionsPT, AVEVA and Reekoh.

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Manufacturing  
Technology Centre



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**mtc**

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Technology Centre

## Introduction

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The Manufacturing Technology Centre (MTC) is engaged in the business of proving innovative manufacturing processes and technologies in an agile environment in partnership with industry, academia, and other institutions. The organisation houses some of the most advanced manufacturing equipment in the world, creating a high-quality environment for the development and demonstration of new technologies on an industrial scale. This provides a unique opportunity for manufacturers to develop new and innovative processes and technologies. The MTC mission to reach engineering excellence through technology is what aligns the organisation so well with leading industrial IT solutions partner and distributor of world-class AVEVA software, SolutionsPT.

Basem Salam, Senior Research Engineer,  
The MTC

“The MTC acts as a safe environment to test and evaluate new technologies, and our experienced and talented staff of more than 700 employees help UK companies to develop and test their innovations with the very latest tools. We work closely with UK industry to ease the digitisation journey and we share the benefits of what we learn with other UK companies. We’ve now worked with hundreds of UK businesses in overcoming challenges and helping to find and test the technologies and approaches most suitable for them.”

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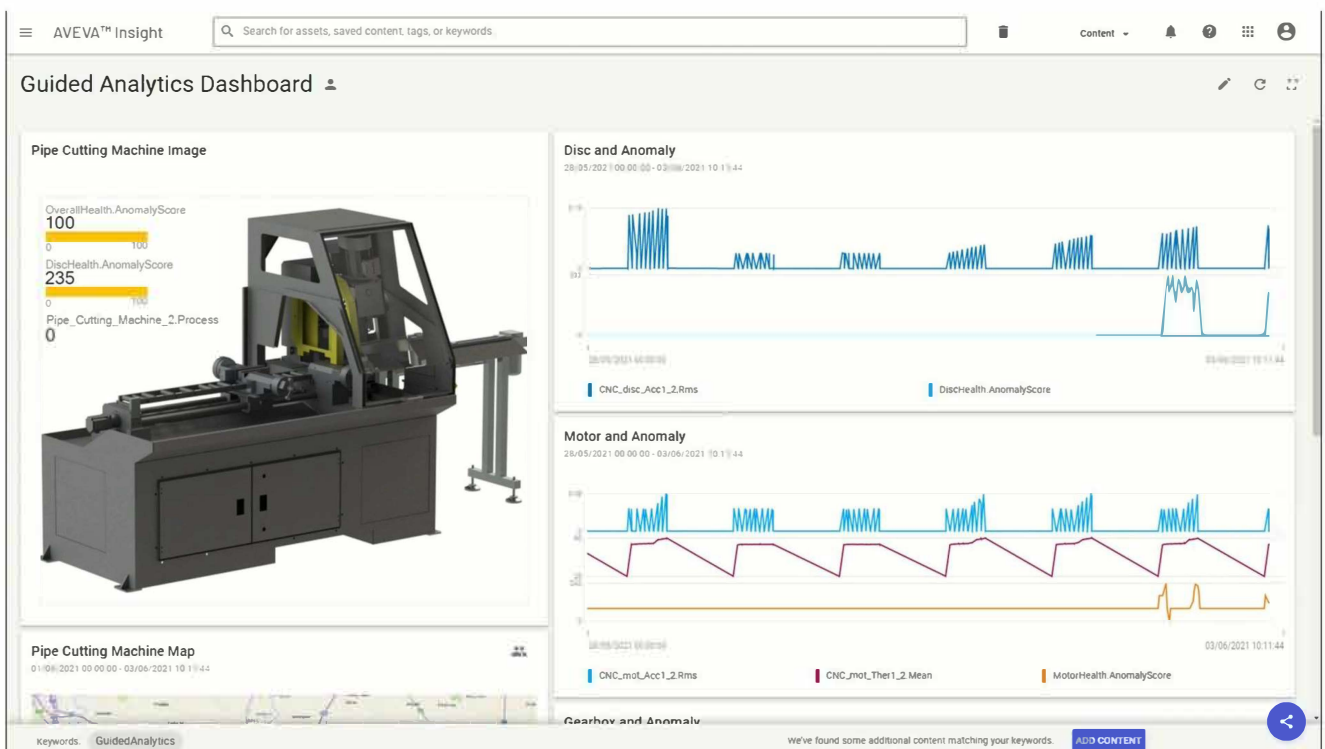
**Working with a company like SolutionsPT and benefitting from their knowledge and experience further enhances the services we are able to offer and helps us with our mission to inspire Great British manufacturing on the global stage.**

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## Introduction (page 2)

David Baskett, Technology & Management Strategy, SolutionsPT

“Working with the MTC is a perfect fit for SolutionsPT. Not only because of the opportunity to work with their skilled engineers to create demonstrators that showcase the very latest software capabilities in practice, but because their drive to help the UK manufacturing sector matches so closely to our own vision of digital transformation success for every UK enterprise. I have been involved in multiple projects with the MTC and they always lead to impactful, beneficial results. The Guided Analytics demonstrator is one I am particularly excited to be talking about.”



*Guided Analytics dashboard showing the models automatically analyse the data and generate anomaly scores to indicate asset health.*



## Background

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As part of the AVEVA Insight Cloud Platform for Industrial Operations, Guided Analytics takes machine learning to the next stage of its evolution and brings the technology within reach of a much broader cohort of industrial enterprises.

Machine Learning (ML) is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving accuracy and enabling (or automating) better decision making, powered by big data. The value of ML to the future of industry is in little doubt – with leading consultancy Deloitte suggesting that ML improves product quality by up to 35% in discrete manufacturing industries, and fellow consultant McKinsey predicting that Artificial Intelligence (for which ML is a key component for realising benefit) has the potential to create between 1.2 and 2 trillion dollars in supply-chain management and manufacturing globally.

Industry has an ever-increasing reliance on data and those enterprises not putting this data to work risk becoming uncompetitive.

The slow uptake of industry-wide adoption of ML is partly due to its complexity. ML algorithms traditionally require an in-depth understanding of data science which is outside of the skill set most industrial enterprises have at their disposal. It is here that Guided Analytics can help by bringing powerful ML capabilities into the domain of IT and OT operators already working in industrial companies. It is important to note that Guided Analytics is not a predictive analytics add-on, it is an in-built feature of AVEVA Insight. It is also not to be confused with Automated Analytics, the default Insight training model, which is based on unsupervised machine learning. Guided Analytics is supervised ML, that enables the creation of custom training models where the user builds unique anomaly detection models without the pre-requisite of extensive data-science or coding experience.

## Background (page 2)

Once the on-boarding process is complete, an end user can enable Guided Analytics and begin training their model in just a few clicks through the configuration-based low-code environment. This was one of the many reasons AVEVA Insight was chosen for the MTC demonstrator. Enabled through AVEVA Technology Partner Reekoh, plug and play integration between IT, OT and the business layer means immediate support out of the box without coding expertise needed onsite.

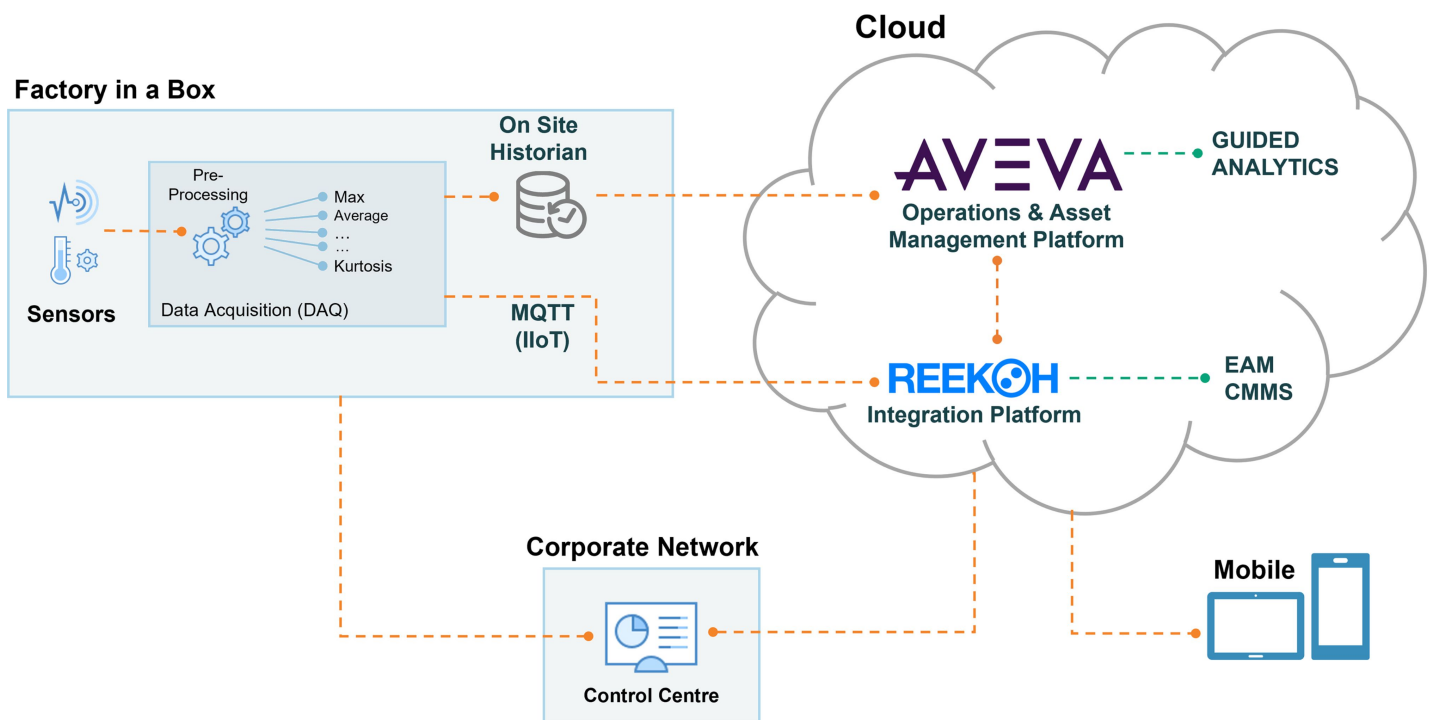
“This out of the box connectivity really sets the system apart and has benefits that reach far beyond the demonstrator. Creating an edge to enterprise connectivity approach, the system will seamlessly connect to the Enterprise Asset Management (EAM) while adhering to all certified security requirements, bringing in data from all IoT devices through the Message Queuing Telemetry Transport (MQTT) no matter how geographically spread those assets are.” Adds David.



# REEKOH

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## High level system architecture



## Demonstrator

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“Showcasing the potential of Guided Analytics was the driving force behind the demonstrator model. The technology testbed shows the use of intelligent anomaly detection and its potential for wider industry use on a range of assets and processes. Spotting anomalies means unplanned downtime events can be avoided, operators can be alerted of sudden energy spikes or even the smallest change in a number of variables, and Overall Equipment Effectiveness (OEE) can be improved dramatically.”  
Says David

“With new technologies like machine learning, there is always a slow adoption period. During this period any company looking at the latest digital technology will often be brought into a CAPEX/OPEX argument, the questions of skills is often brought up as a level of training is always needed. What the demonstrator does is allow those UK manufacturers to come and see Guided Analytics in action with no risk.” Adds Basem

As industry adopts a more data-led approach in the era of digital transformation, machine learning will be an integral technology. Guided Analytics is the output of machine learning, an easy-to-use way to build data models, and, more importantly, a straightforward way to get valuable, tailored insight from them.

Using a cutting machine as the data source, the demonstrator shows an in-depth understanding of the state of the asset. Leaning towards an intelligent predictive maintenance model, the data describes the health of the machine from several inputs including energy consumption, temperature, and vibrations.

“Guided Analytics is a true example of machine learning. From the moment it is deployed, it sets to work recording and analysing historic data sets. It compares those with live data for a more accurate review of anomalies and performance over time.”  
Adds Basem



## Demonstrator (page 2)

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Using the demonstrator to show the potential advantages of Guided Analytics on a single machine, offers a tantalising glimpse of the potential for adoption throughout an enterprise. Applying data models for each asset can be replicated across entire connected factories, and across multiple sites, with compound benefits throughout an organisation.

“As is often the case in manufacturing facilities, it is not easy to immediately see the area that is contributing to anomalies or failure conditions. If that was the case, you would simply deploy maintenance there and then. Guided Analytics works for complex production processes. This gives operators the tools they need to assess and maintain every asset on the factory floor, whether there are two machines or two hundred. The implications for improving Overall Operation Effectiveness (OEE) places AVEVA Insight and its Guided Analytics functionality at the forefront of digital transformation technologies.” Says David

## Human data load

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As industrial leaders know, an abundance of data can be a help or a hindrance; when it helps, it informs efficient operations, but if it is too complex, it can cause operator overload, which undermines its usefulness.

To help ensure that Guided Analytics prevents data overload for operators, cloud graphics are available straight out of the box with no extended coding necessary. This functionality also helps overcome the skills issue often implicated in the take-up of new digital technologies. The demonstrator proves the remarkable ease of use, with configuration of a Guided Analytics model literally taking seconds, and with no time spent on coding or pipeline configuration.

The graphics act as a data filter, ensuring the operator is only seeing what is necessary to complete their job function with the opportunity to drill down for further detail through simple, intuitive dashboards. Previously, this high-level of machine learning would have required a data scientist to create the models along with reams of code, but the simple-to-use demonstrator shows how these models can be applied by operators with even the most basic IT or OT background. The low code integration approaches enables Guided Analytics to deliver insight and show benefits within a few clicks, capabilities previously unheard of in the control system industry.

## Human data load (page 2)



*Automated alerts are generated when the asset health is degrading.*

**SolutionsPT and the MTC both agree that most valuable asset of any production facility is the human workforce. But for that human workforce, their most valuable asset isn't a high-cost piece of equipment, it's time. Since time cannot be made, only be saved, Guided Analytics offers a valuable insight into the productivity benefits of digital transformation.**

## Conclusion

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Machine learning is vital to the future of industry and Guided Analytics offers a direct pathway to the benefits. Companies don't need to bring in data scientists or make huge time investments into complicated coding. The simplified model enables access to asset operating conditions whilst reducing the cognitive load on operators.

By making use of the unique demonstrator at MTC, UK industrial companies can understand how Guided Analytics will help them in their digital transformation journey, offering hands-on experience of the simple configuration, ease of use, and potential productivity benefits this important technology offers.

Moreover, the Guided Analytics demonstrator builds further on the capabilities on offer to UK companies who engage with MTC or SolutionsPT.

"Each and every demonstrator we complete plays a part in the next one. What I mean by this is that when companies come with new problems to overcome or projects to testbed, we are never starting from point zero. The starting point for the next project will always be the end point of our accumulated experience and knowledge. The insight and value we have seen in the Guided Analytics provides powerful means to reach the highest level of OEE." Adds Basem

The common goal of the MTC and SolutionsPT to help UK industry reach engineering excellence through digital technologies and an empowered human workforce has led to multiple projects and a beneficial collaborative relationship, and it is set to continue with even more exciting capabilities for UK manufacturers.

## Conclusion (page 2)

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“Working with SolutionsPT is much more than a simple vendor relationship that ends with the purchase of equipment or software. We see SolutionsPT as an extension of our team and work closely with them to help UK industry prove its potential in the era of digital transformation. The SolutionsPT team is extremely knowledgeable on the products and always on-hand in their application whenever we need them. Our organisations are perfectly aligned to help UK industry to make the most of the opportunities in this most exciting time.” Concludes Basem

Guided Analytics shows the potential of machine learning within industrial settings, it also shows that the benefits associated with machine learning are within reach for most companies. There is no need for a data scientist or mountains of code to set algorithms and enable advanced maintenance strategies. Manufacturers can see Guided Analytics in action with the MTC, providing a low-risk environment to explore the benefits, advance digital transformation and be supported by the experts at every stage.

To visit the Guided Analytics demonstrator, and see further collaboration between SolutionsPT and The MTC, please visit [www.solutionspt.com/mtc-solutionspt](http://www.solutionspt.com/mtc-solutionspt).



# Get in touch

We'd love to hear from you



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