Astronics

Make the Most of the Data You Produce

Train subsystems have a lot to tell you – it's all there in the test data you're producing, writes Bagali Siddaram, Director of Mass Transit at Astronics.

The rail industry is becoming ever more digitalised, including our specialist area of test, repair and support. This is becoming increasingly software-intensive, as onboard systems as well as trackside and wayside equipment continue to become 'smarter'.

By 'instrumenting up' a train, which involves fitting a wide variety of sensors to these advanced electronics, these subsystems are providing operators with a rich source of information on the health of their equipment.

Do More with What You Already Have

Today transport operators have data from their repair facilities and processes in droves, but not everyone is making the most of this information goldmine.

The data's there for the taking, it's just a matter of extracting and making sense of it, and if used correctly, can provide some significant financial and operational benefits.

For example, analysing your data can help you to understand whether fleet-wide maintenance is necessary, as well as better predict when such activities will need to take place.

Predictive Maintenance Solutions

This is made possible through the use of mature artificial intelligence (AI) and machine learning (ML) technologies, which may be simpler – and cheaper – to implement than you might think.

There are two main pathways you can take. The first analyses the large sets of data you've already produced and gathered from testing your subsystems. By doing so, it teaches an AI or ML algorithm how to uncover trends, spot anomalies and predict component lifecycles. Plus, as it's continuously fed more information, it becomes ever more accurate.

The second route needs a little more effort. This involves segregating the data based on the subsystem, before 'feeding' it to the algorithm.

Efficiencies May Be There Now

Implementing predictive maintenance doesn't have to require a large pay-out; the majority of what you need may already be in place and readily available.

Managing this data doesn't involve investing in a new enterprise resource planning (ERP) or database maintenance system, for example; a predictive maintenance tool can easily be integrated into an existing system.

In terms of the AI and ML technology, there's no need to develop your own algorithms. Many of these are available on the market for low or no cost (freeware), meaning no additional software fees.

Finally, there's no need to invest in new skills or specialists. This concept enables you to use members of your existing software team to model and implement these solutions.

As you can see, accurate predictive maintenance is possible at no extra cost – it's simply a case of using what's freely available to gather and analyse the data you already produce in a meaningful way.

Centralise Your Data

To make the implementation of predictive maintenance

easier, it's worth looking to centralise your data if you haven't already done so.

Subsystems will often have their own tools to 'read' the raw data, which may lead to transport authorities using a myriad of tools from different manufacturers to understand the information they produce.

The best approach for managing this is to integrate all the third-party tools into a single system that can convert all the data into the same readable format. By doing so, you can store and access all your data in one place and one format, irrespective of what each subsystem puts out. It also creates a centralised database that can be used to feed the algorithm the information it requires to develop predictions.

Without doing this, your predictive system would need to be trained to read data in a variety of different formats, which is an unnecessary and avoidable investment of your time and resources.

Want to Give It a Go?

If you're interested in implementing predictive maintenance, we recommend starting small and then expanding.

Start with a pilot scheme on one subsystem and use

your chosen AI or ML algorithm to analyse its data and then check the results. This step could take some time, as the algorithm will need to learn about your data and how to analyse it. Once this predictive system has been implemented and proven, you can then extend it out to all subsystems with confidence.

Partner with Astronics

From a service and maintenance perspective, Astronics believes predictive maintenance is a big part of the digital transformation of the rail industry. We plan to continue being ahead of the curve when it comes to offering our customers the most advanced and comprehensive solutions.

As a consolidated test solution provider for the rail industry, we're unique as we touch every on-train component before it's certified and rolled out. And our BTE is designed to test every component that comes back. This means we're able to capture data from both healthy and faulty units, enabling us to understand the time to – and class of – failure. Developing on from this, we're now proactively working on using AI and
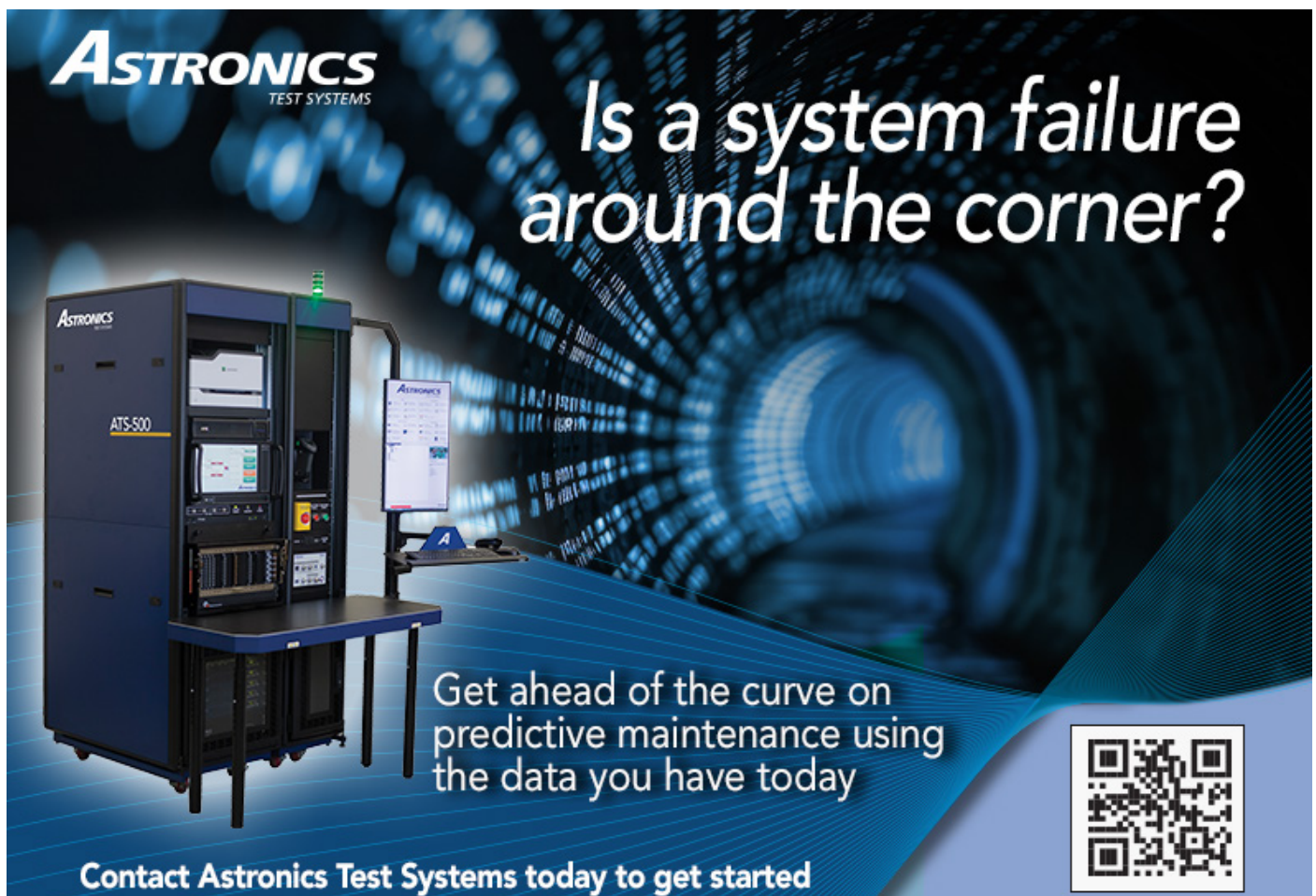
ML algorithms to provide customers with a predictive maintenance solution that fully utilises existing resources.

Our test solutions are already gathering the raw data necessary to support predictive maintenance; this is simply the next step in providing our customers with the information they need to ensure they make the most of their equipment and manpower.

Our consolidated approach also means that all test results captured are gathered into one database, removing the need to task your teams with centralising your subsystem test data into a single new database.

To find out more about how Astronics can support your organisation, please visit our **website** or **email** us.