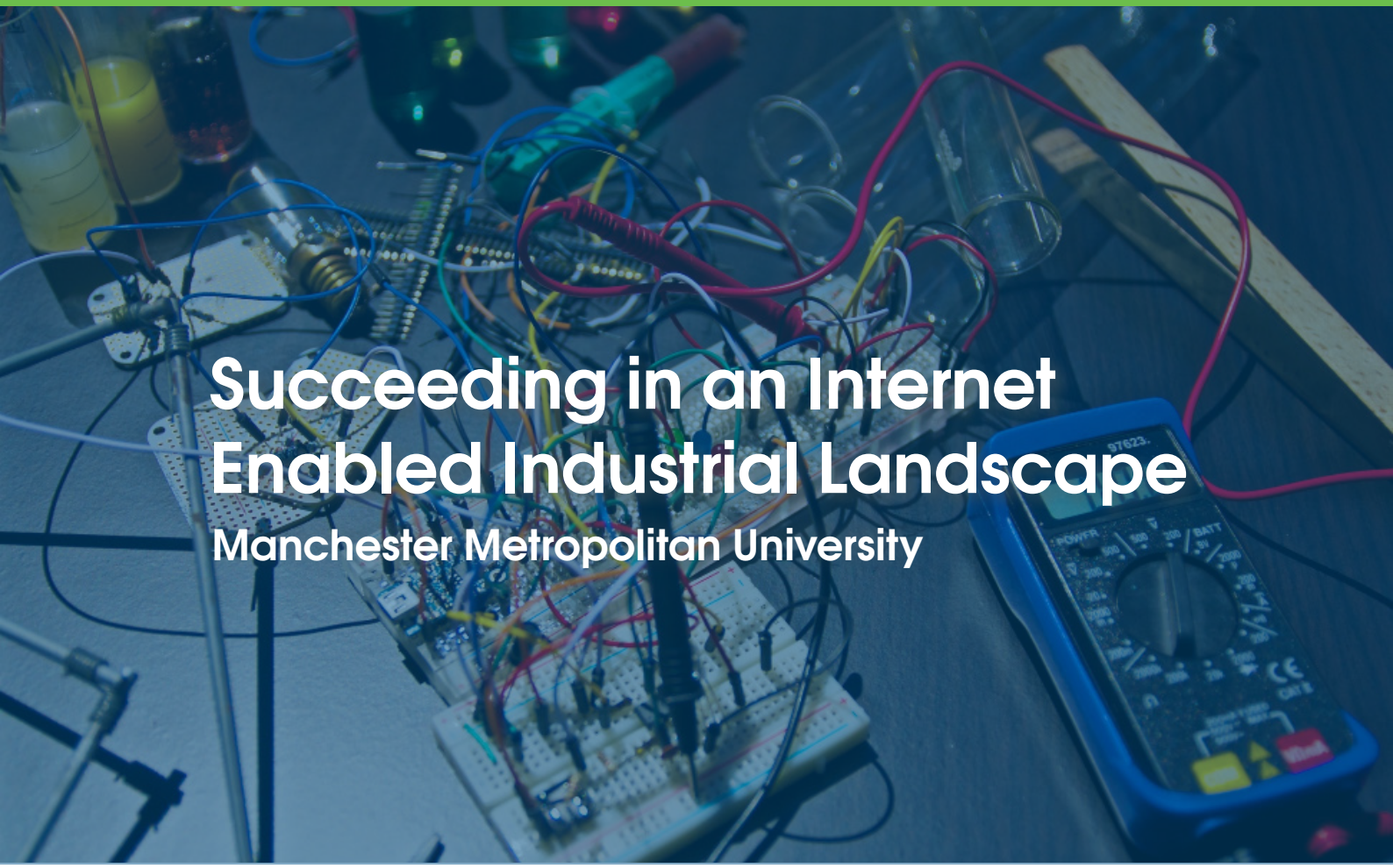


Succeeding in an Internet Enabled Industrial Landscape

Manchester Metropolitan University

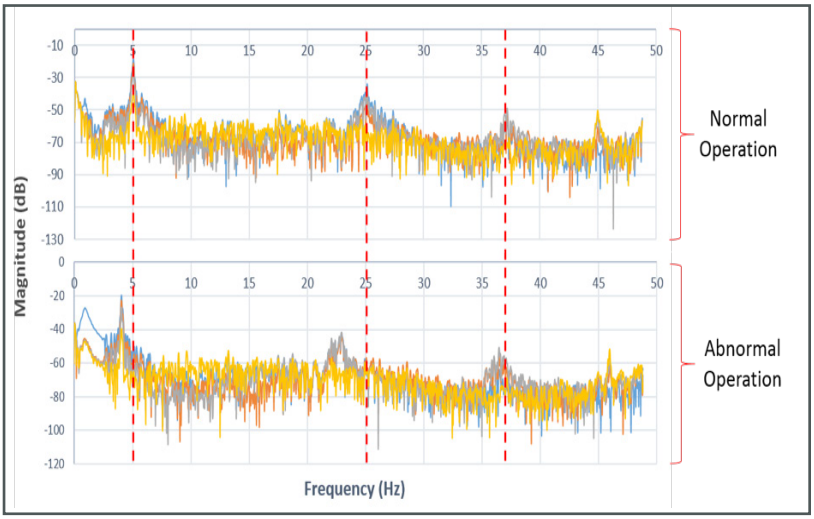
> ThingWorx® has been particularly helpful for our Mechanical Engineering students in gaining practical skills and a fundamental knowledge of IoT."

Dr. Sophie Lo,
Principal Lecturer

How Manchester Metropolitan University has implemented ThingWorx and IoT in its curriculum

At Manchester Metropolitan University, students worked with ThingWorx in a project that helped illustrate the Internet of Things in an Industry 4.0 use case. Students were tasked with developing a digital twin of an experimental vibrating tower in order to monitor how it would react to various conditions. A digital twin is a digital representation of a physical asset where real-world operational data can be sent to the digital twin and analyzed. To measure and analyze the data, the twin acquired data from the physical asset and then sent it to ThingWorx. With ThingWorx, this information was visualized using widgets such as gauges and time histories.

The students were able to test the tower under normal conditions to calculate the base response. It was then tested under varied conditions, such as added mass and a damaged support leg. The response was then analyzed and defining features were extracted. From here a database was created containing information relating to possible conditions of the tower. ThingWorx was used to map the real time response of the tower to the database and thus help identify the cause and possible effects.



The graph above shows the data that was sent to ThingWorx. It was used to identify when the frequencies deviated from the location associated with normal operation.

Why use a Digital Twin?

Analyzing the data from a digital twin provides operational insights and a greater understanding of your physical asset. This analysis can also help reduce operating costs by reducing the need for onsite inspections. Further, digital twins can identify when maintenance will be required and therefore minimize losses due to unplanned downtime.

Physical asset of the digital model

> "One of our students was recently successful in a job interview due to the knowledge and experience he gained with IoT and ThingWorx through this project"

Dr. Sophie Lo,
Principal Lecturer

Manchester Metropolitan University