ThyssenKrupp Elevator

Using rich data insight to drive proactive, predictive maintenance

ThyssenKrupp Elevator (TKE) is the largest producer of elevators in the Americas, providing and maintaining more than one million elevators around the world. TKE wanted to transition to a more proactive and predictive maintenance approach driven by real-time data and rich, valuable insight. CGI was brought in to design, build and implement an insight-driven elevator monitoring system pilot that leverages the latest Internet of Things (IoT) technologies and is helping ThyssenKrupp to achieve its strategic maintenance objectives.

THE CHALLENGE

TKE had a number of initiatives around the world to allow remote monitoring of their elevators. However, none of the solutions provided the data and insight required to move from a traditional reactive maintenance approach to one that is predictive and even preemptive and all suffered from issues with information overload that limited their value. TKE wanted a solution that would enable it to anticipate and quickly resolve maintenance issues for the majority of the 1.2 million elevators it services across the globe. Above all they wanted a system that would present the engineer with options.

THE SOLUTION

CGI’s development team built a pilot, cloud-based elevator monitoring system using Microsoft’s Azure Intelligent System Service (ISS), Machine Learning (Azure ML), HDInsight and our own Intelligent Enterprise Framework (IEF), which facilitates the rapid deployment of IoT applications. This solution took only 8 weeks to implement, highlighting the fast speed to market.

Integrated with TKE’s elevator sensors, the system harnesses data from each device, processes the data using business rules defined by TKE, and generates rich data insight using predictive analytics. The resulting insight is then made available to supervisors and site technicians via two different user interfaces in the form of maintenance alerts, instructions and recommendations.

CGI worked with Microsoft to develop predictive data models using Microsoft’s Machine Learning Azure service. Years of historical data from elevators across North America were analysed to generate mappings of sequences of Alarms to root cause faults. We also partnered with Creative Jar to design the user interface for the system.
interfaces, with a focus on providing concise and easy to consume information in a format compatible with tablet devices.

Once trained from historical data the system is then augmented by feedback each time an Engineer is on site. This allows the system to become more accurate over time.

“We wanted to go beyond the industry standard of preventative maintenance to offer predictive and even preemptive maintenance, thereby guaranteeing a higher uptime percentage on our elevators.”

Andreas Schierenbeck, CEO, ThyssenKrupp Elevator AG

THE RESULTS

The system was implemented for a small number of elevators run by ThyssenKrupp Elevator in the Seattle, Washington area in the summer of 2014. The pilot project was a success, enabling the company to reduce elevator downtime and improve resource planning, cost forecasting and maintenance scheduling. In turn, TKE has been able to provide a more competitive offering to its customers.