Leveraging Digital Twin Technology in Engineering Equipment and Operations

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A digital twin can be defined as a digital representation of a physical asset, its related processes, systems and information. A digital twin continuously **learns and updates itself through sensor data that measure various operational aspects,** through input from experts with relevant industry knowledge, using data from similar assets, and from interaction with the environment. It performs functions, such as:

- Validate system model with real world data
- Provide decision support and alerts to users
- Predict changes in physical system over time
- Discover new application opportunities and revenue streams

BENEFITS OF A DIGITAL TWIN

A digital twin technology:

- Enables real-time monitoring of systems, processes and allows for timely analysis of data to head off problems before they arise.
- Schedules preventive maintenance to reduce/prevent downtimes

  while providing early insights into system behaviour.

- Uncovers new business opportunities and plans for future upgrades and new developments.

- Has the potential to reduce the cost of system verification and testing while providing early insights into system behaviour

CHALLENGES IN APPLYING DIGITAL TWINS

- Cost
- Precise Representation
- Data Quality
- Interoperability
- Education
- IP Protection
- Cyber Security

Finally, digital twin technology can be utilized to optimize the operation and maintenance of physical assets, systems and manufacturing processes across industries such as manufacturing, materials science, industrial products, life sciences and healthcare, infrastructure and urban planning, the energy sector, consumer, retail and e-commerce, and logistics.

Therefore, complex prognostics and intelligent maintenance system platforms can use digital twins in finding the root cause of issues and improve productivity.

For more information on this, send us an email at lagos@feddogroup.com