DMA
DIGITAL
MANUFACTURING
ACCELERATOR
FROM THE MANUFACTURING TECHNOLOGY CENTRE

SOFTWARE-IN-THE-LOOP METHODOLOGY

Software-in-the-Loop testing is a methodology where digital manufacturing solutions are tested automatically, offline in a connected virtual environment, reducing deployment costs.

THE CHALLENGE

Initial deployments of digital manufacturing solutions such as manufacturing execution systems (MES), enterprise resource planning (ERPs), digital twin and Industrial Internet of Things (IIoT), typically require production interruptions to perform testing trials to ensure that the solutions work as intended.

The testing trials are costly, requiring justification of the benefits and impact from these digital solutions. The challenge is minimising negative outcomes, including delays and higher costs, during commissioning.

mtc
Manufacturing
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STRATEGIC INVESTMENT FUND

MTC'S SOLUTION

The Software-in-the-Loop testing platform is a virtual simulation environment with the same connectivity interfaces as production systems. It can mimic a production systems' behaviour and generates the equivalent communication signals. Digital manufacturing solutions can be plugged into the platforms' connectivity interfaces and communicate in the same way as if deployed into a live production system.

Software-in-the-Loop testing does not require real-time execution as it is proving control logic and decision-making functions to improve various operations in the system.

"USING SOFTWARE-IN-THE-LOOP TESTING ENABLES MORE ACCURATE TESTING EARLIER IN THE DEVELOPMENT AND IMPLEMENTATION PROCESS. THIS LEADS TO BETTER QUALITY IMPLEMENTATIONS OF DIGITAL MANUFACTURING SOLUTIONS AT A FASTER PACE."

MIKE BETT
Technical Specialist,
The Manufacturing Technology Centre

THE OUTCOME

A Virtual Factory Environment was applied in a pharmaceutical, FMCG and personal care manufacturing use case and has been created with industry standard tools and interfaces.

Using the Software-in-the-Loop testing platform allows trialling, testing, and validation of digital manufacturing solutions in a virtual simulation environment, without interrupting production operations.

The Software-in-the-Loop testing platform allows the trial of digital manufacturing solutions significantly quicker than traditional methods, as the simulation that mimics the production systems' behaviour can run in accelerated time.

Digital manufacturing solutions can be evaluated for different production scenarios, including rare occurrences and edge cases, to evaluate their robustness as well as their limitations.

BENEFITS TO THE CLIENT

Software-in-the-Loop makes the launch of digital manufacturing solutions substantially cheaper by avoiding production interruptions.

It enables effective trials of these solutions in advance, for a range of scenarios, thereby achieving a right-first-time engineering approach.

Stepwise and continuous evolution of the digitalisation journey, flattening the learning curve, smoothing transformations, and resiliently adjusting where and when necessary to maximise impact.

Cheaper deployment, iterative adoption, and more thorough testing remove numerous barriers and risks, further enhancing the solutions' benefits.

To find out more contact the Digital Engineering Team via enquiries@the-mtc.org, or visit www.digitalmanufacturingaccelerator.com

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