

TheoremXR

TheoremXR Case Study

Customer:
Valiant TMS

Industries:
Design & manufacturing,
process automation

VALIANT TMS

Mixed Reality: Delivering Return on Investment

About Valiant TMS

Valiant TMS is a global company powered by people working together to be the most trusted partner in delivering intelligent automation solutions. The company is a full-service Industry 4.0 system integrator leading the way in digitalization, process development, design and technology integration. Valiant TMS specializes in welding and joining, automated assembly and test, industrial parts washers and final assembly systems. The company was founded in Windsor, Ontario in 1959 and today operates from 24 facilities in 13 countries with 1,700+ team members serving companies in the automotive, aerospace and heavy industry sectors.

Partnering with Theorem Solutions

We interviewed **Suresh Rama, Director, Business Intelligence and Innovation, Raymond Slowik, Senior R&D Engineer** and **Jaee Jadhav, Mechanical R&D Engineer** from Valiant TMS about their experience of working with Theorem and to discuss some of their current and future use cases.

Valiant TMS started using Theorem's CAD conversion solutions about 10 years ago. When they began looking for a partner to help them develop a merged reality and IIOT concept – the direction Theorem had taken with its' XR visualisation tools with the use of 3D CAD content to create holographic models using the Microsoft HoloLens – had yet again made Theorem the perfect partner.

Objectives

The Merged Reality Concept

Let's begin by talking about the Valiant TMS merged reality concept?

Suresh: I have a teenage son at home who is really into virtual reality and video games and one day it struck me that his experience growing up must be so different from mine when I was his age.

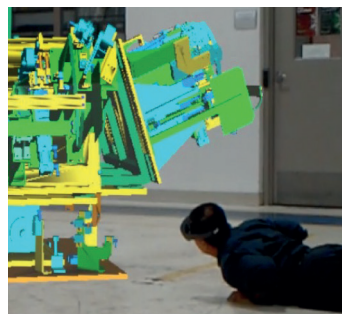
I assembled a team to begin studying virtual technologies and how we can apply them to our process of designing and integrating industrial automation solutions. We knew we were on the brink of a major shift in how the industrial sector uses technology as we were already seeing it infiltrate this space in small ways.

While my team dove into their research, I briefed our senior management team and received overwhelming support to continue down this path. Their forward-thinking attitude was centered on our ability as a company to serve our customers and align with their aspirations and vision of the factories of the future. As a trusted automation partner, our customers expect us to be leaders in this area.

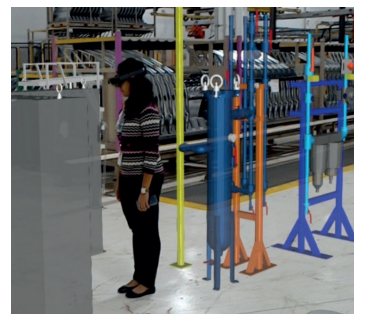
What started as an idea and concept within our North American operation is now being used by our teams globally; growth and adoption is still accelerating as more people are exposed to the benefits it brings. The COVID-19 pandemic has been a factor in increasing the rate of adoption because people need new ways to collaborate due to travel restrictions and health and safety concerns – the fact is that people still need to work in a team environment, they just need to do it from home instead of the office or plant.



Ray Slowik pictured using a Microsoft HoloLens to compare physical and virtual part fixtures



Identifying any access issues to a piece of machinery that requires maintenance



Viewing a large scale model (25m long x 10m wide) in the Microsoft HoloLens

“After comprehensive research, we selected Microsoft HoloLens as our hardware platform and Theorem-XR as our software solution because of how well it worked with our existing 3D CAD data and aligned with our ideas and concepts.”

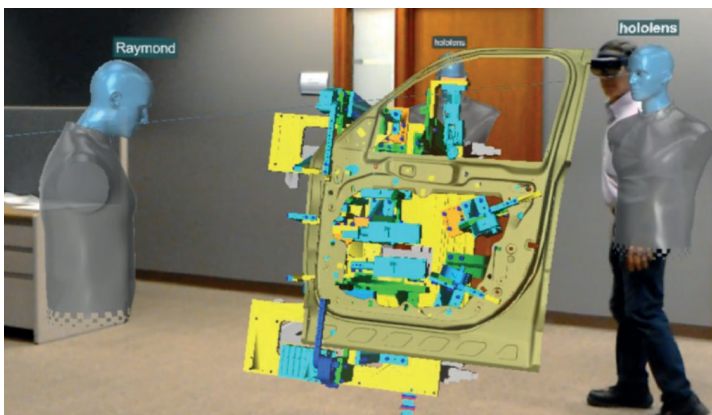
Developing a Strategy and Concepts

Leveraging and applying new technologies

Merged Reality and IIOT for Valiant TMS

Ray: I was tasked with developing a strategy and concepts to leverage and apply new technologies, such as merged reality and IIoT (industrial internet of things), for Valiant TMS.

I spent a long time researching and examining various hardware and software technologies from several companies to determine how our vision and what we needed differed from or aligned with what was currently available. We realised that there are two potential paths to implement a merged reality solution.



Carryout out a design review with colleagues in different locations

One path is through the visualisation and utilisation of our 3D CAD content to create holographic models that can be used and manipulated in space and in the real world through head gear or other forms of visualisation hardware. The other path, was the utilisation of information transfer, allowing individuals to quickly acquire knowledge based on directions provided through the visualization hardware. This is most often seen in instructional applications and many of the companies that we researched approached it from that direction.

Our focus is on design, build and integration of automation equipment and specialized manufacturing technologies. We wanted to empower the people on our manufacturing team with effective tools that would allow them to engage with the CAD design data as they assemble the actual equipment with the ability to validate that it's been done right.

“Today, we have made significant progress. Many of our teams have adopted this technology and use it every day – they rely on it to perform at a higher level.”

Return on Investment (ROI)

What about ROI in terms of cost/time savings that can be expected by implementing some of your use cases?

Suresh: We have several cases where traditionally it may have taken days to carry out a task, required travel time and related expenses and may have delayed our project timing. After adopting HoloLens with Theorem XR and applying them to our process we've been able to do many of these tasks in a matter of hours, without having to travel. It's much more efficient. We have described several specific use cases to show some of the ways we have used the technology and realized benefits.

Use Case

Upgrade to Windshield Installation Robotic Cell

Theorem software on the HoloLens was used to verify clearances and detect interferences at our customers' production plant. Valiant TMS used design models in the JT format which were virtually overlaid into the physical assembly line prior to building the tool kits.

- Robotic assembly cell was approximately 1,500 ft² in size
- Inspection occurred on a regular workday during 30 minute line stoppage at lunch
- Using HoloLens, the inspection was performed without the need to enter the cell and took approximately 1 hour in image collection and uploading for review
- Traditionally a laser scan can take upwards of 5 hours to carry out and requires the line to be stopped and emptied with a lock-out tag-out (LOTO) procedure carried out for safety – that's why they are typically done off-shift or on a weekend
- Design engineers attended the on-site review and were able to visualise the tool changes from multiple angles in real time – this is not possible using the laser scan method
- Information was available to the engineers immediately after inspection – laser scan method would not be available for at least 2 days (1 day scan, 1 day processing and delivery)

Use Case Savings Summary:

- *At least 4 hours on processing scans/data*
- *Data available immediately instead of waiting 2 days*
- *Positive impact on project timeline by not waiting for off-shift or weekend line stoppage*

Summary

Theorem's Visualization Experience software has provided Valiant TMS with a unique opportunity to visualize 3D CAD models placed directly over real world equipment, tooling and components. Valiant TMS' use of the software has improved their ability to quickly inspect tooling and components prior to acceptance from their vendors, ensuring that as-built components match as-designed plans, saving time and money at the assembly site.

Talk to our team today about your XR requirements and learn how we can help you start your journey.

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