New Trends in Digital Reality

GLOBAL PRODUCT DATA
INTEROPERABILITY
SUMMIT
2017

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The Democratization of Digital Reality

Presenter: Trevor Leeson

Presenter Biography – Trevor Leeson

- Starting his engineering career working for an automotive supplier in 1970, Trevor progressed from the position of Engineering Apprentice to Assistant Chief Draughtsman responsible for the manufacturing tool design for printed circuits, metal pressings and injection molded components.

- Joining Computervision's software services division in 1985 as an Application Engineer he advanced to the position of Technical Program Manager for the Rolls-Royce Aerospace account. In this position he managed the Rolls-Royce investment of $54.4M in CADDS5: responsible for both core software deployment & customer specific consultancy development projects.

- From 1997 – Today, Trevor has worked for Theorem Solutions in a variety of technical roles, Technical Consultant, Product Manager & Consultancy & Services Director. He's represented Theorem Solutions at various standards organizations including PDES & ProSTEP for STEP solutions as well as the ProSTEP iViP JT Implementers Forum & Siemens JT Open Technical Review Board. He's currently one of Theorem's Principal Technical Consultants working with a number of their major automotive and aerospace accounts.
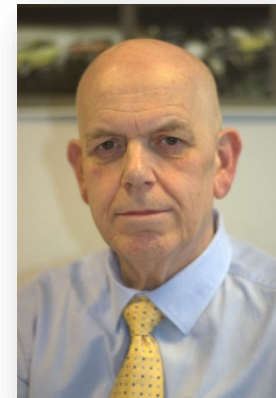
Agenda

1	**Theorem Solutions Overview**
2	**Definitions**
3	**High-end Virtual Reality**
4	**Democratization of Digital Reality**
5	**Digital Realities – Experiences**
6	**Digital Realities – Visualization Experience Use Cases**

Theorem Solutions

Theorem Solutions

- Established in 1991
- Engineering Heritage

Locations

- UK Head Office
- 2 US Offices

Products

- Engineering Data Visualization
- Engineering Data Exchange
- Process Automation
- 3D Publishing / Documentation

Consultancy Services

- Implementation / Customization
- User Training

Development Partnerships

- Vendor APIs
- ISO Standards i.e. STEP / JT / 3D PDF

Customers

Partners
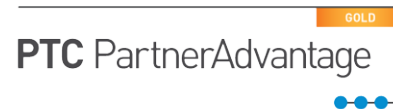
Visualization Experience - Background

JT Early Adopters

- Products based on Engineering Animation Inc. (EAI) technology in the late '90's Engineering Animation (JT in VR)
- Siemens resell a number of Theorem products under licence

PTC (Division)

- Providing products based on Division's VR dVise mockup format from 1995
- Providing products based on PTC's Creo View software

3D XML

- Providing products based on Dassault's 3D XML format

Digital Realities Definitions

Virtual Reality

- Being fully immersed in a virtual environment i.e. in caves or using a head mounted display e.g. HTC Vive

Augmented Reality

- The ability to view digital data and physical objects on traditional devices such as tablets and laptops
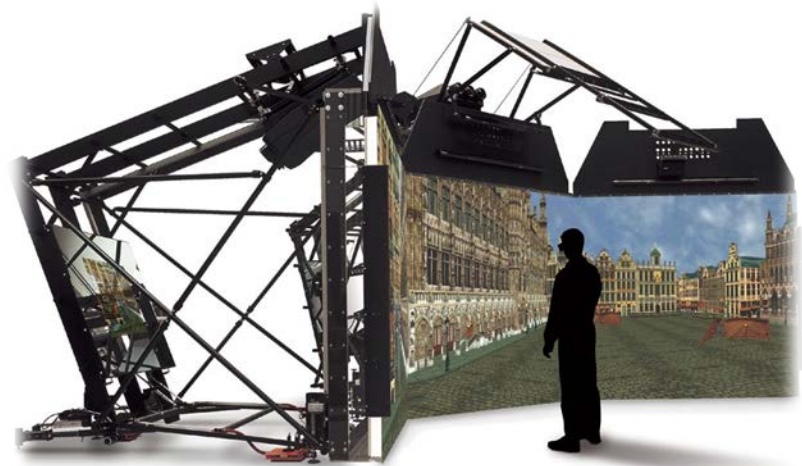
Mixed Reality

- The ability to view digital holographic data and physical objects on devices such as glasses and headsets e.g. Microsoft HoloLens

High-end Traditional Virtual Reality Implementations

- Early adoption since beginning of 1990's
- Implementation of large scale Power Walls and Immersive Caves
- High investment for both software and hardware infrastructure, typically >$500K

Typical investment $250 - $5,000 hardware infrastructure – digital reality experiences for a wider engineering audience. Virtual reality solutions available for the desktop or in the workshop.
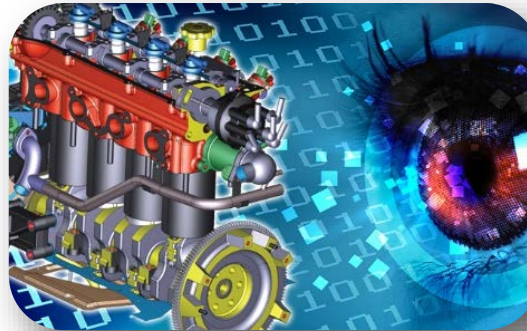
Data Independent Visualization Experience that provides

- 3D Geometry & Product Structure Navigation
- Data Positioning
- Access to external Metadata
- Interactive User Tutorial
- Support
  - CATIA V5
  - NX
  - JT
  - Creo
  - STEP
  - SolidWorks
  - Inventor
  - 3DExperience
- Preparation of data for Visualization

Tailored Experiences

- Consultancy based project support for specific use cases
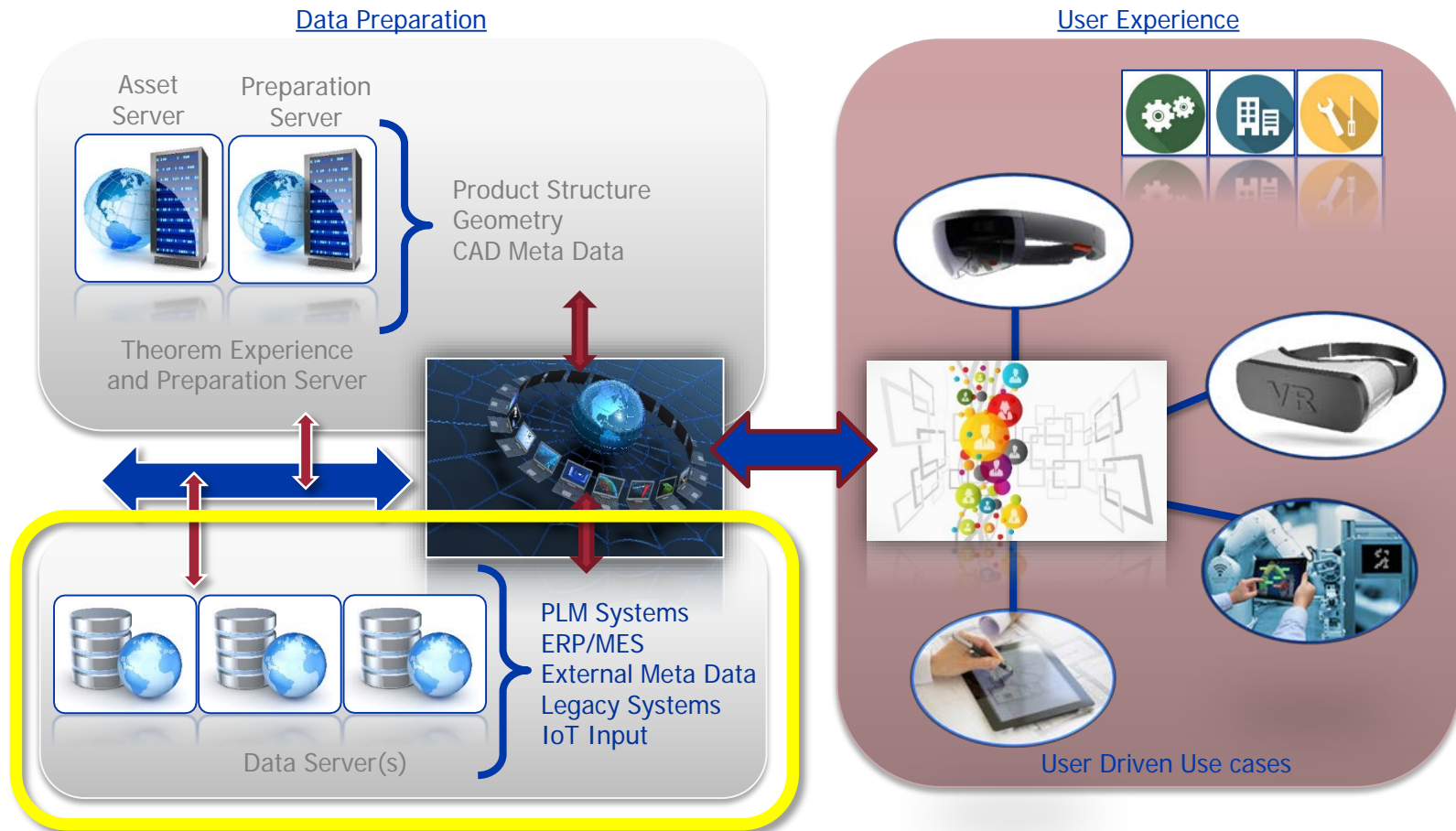
Use Case Focus

- Serviceability
- Maintenance
- Training
- Design Review
- Digital Mock-Up
- Manufacturing

Platform Support

- Tablet Support (Android / Surface)
- Microsoft HoloLens
- HTC Vive, Oculus Rift

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Digital Realities Implementation

Data Preparation

User Experience

Asset Server

Preparation Server

Product Structure
Geometry
CAD Meta Data

Theorem Experience
and Preparation Server

PLM Systems
ERP/MES
External Meta Data
Legacy Systems
IoT Input

Data Server(s)

User Driven Use cases

Leverage existing engineering infrastructure and data

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Typical Examples of User Experiences

Tablets
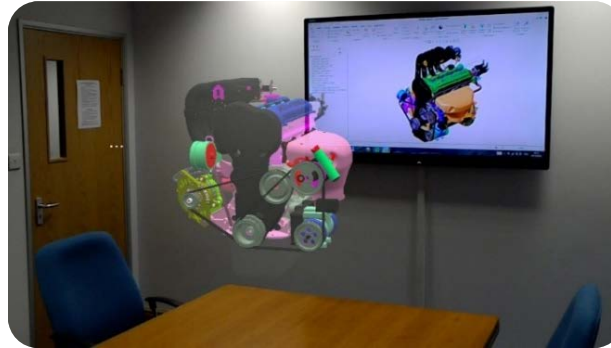
Microsoft HoloLens

HTC Vive Oculus Rift

Visualization Experience

- Controlled access to published data
- Selective query of associated metadata
- Interactive exploration of assembly structure
- View manipulation and positioning
- Visual target positioning
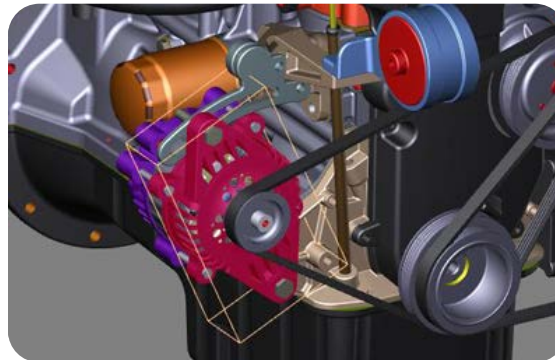
Stage Build Experience

- Visualize build sequence
- Web service communication of activity status
- Display 2D operator instructions in context of build sequence

Data Preparation Process

Integrated to PLM,
Change State Triggers Preparation

Drag and Drop File
Processing

Save as "Digital Realities" from within
CAD menus

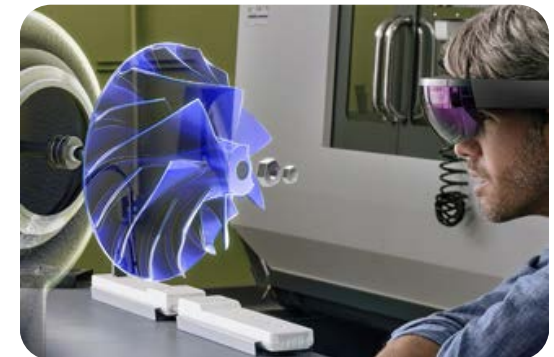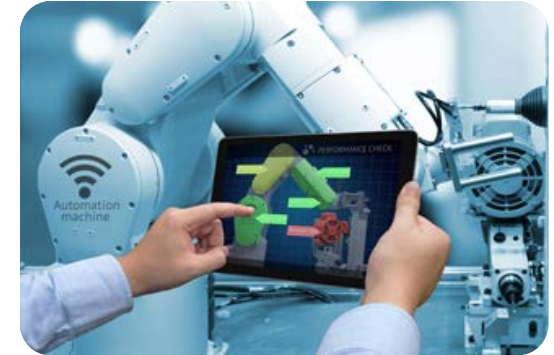# Demonstration video of Digital Reality

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Typical Visualization Experience Use Cases?

Design Reviews
Manufacturing
Product Servicing
User Training
Sales and Marketing

Summary - Theorem Value Add

- Data Source Agnostic
- Target Device Agnostic
- No Preparation of source data
- Ability to load large data sets
- Automated flexible preparation
- Efficient data transfer / load
- Data funnel for upstream VR
- Links to enterprise systems
- Use case to Experience capability

Live Demonstration in Exhibition Area

Tablets

VR Devices

Microsoft HoloLens

Please visit the Theorem Solution stand in the Exhibition Area to experience these new Digital Reality capabilities at first hand

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