



Top Core System Co., Ltd. Introduction

August 2024



Challenge 2024

Top Core System Co., Ltd. (TCS) has developed proprietary OpenGL-based real-time 3D engine core technology through years of R&D, specializing in providing high-capacity, high-performance solutions tailored to industrial needs, along with API integration. We offer 100% domestically developed technology and supply collaboration solutions based on DX for global markets.

Company Name	Top Core Systems Co., Ltd.
Date of establishment	July 1, 2013
Founder and CEO	Lee Sang Bong
Capital / Revenue	4.6 billion KRW (3.82 million USD) / 10 billion KRW (8.31 million USD)
Number of regular employees	16 (7 in platform development, 5 in solution development, 2 in 3D design, 1 in business strategy, and 1 in sales)
Location	704, Tivon Tower, 31 Bongmyeong-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, Republic of Korea
Business sectors	Metaverse, AI, Digital Twin, Simulator, Smart Factory, Smart City, Blockchain
Certification status	*Corporate research institute, venture certification, 2 patents granted, 4 patent applications, 3 intellectual property rights
Key products	<ul style="list-style-type: none">• Metaverse Factory / City / 5D BIM / AI Equipment Predictive Maintenance• Metaverse-based ICT Convergence Integrated Command Platform• Interpretation and Optimization Simulation Services• Real-time Collaborative Service Platform• XR Immersive Service Platform• Cloud SaaS-based Service Platform



HISTORY

Growth

- 2024 - Launch of Web / Mobile-based 3D simulation service
- Launch of Web / Mobile-based digital twin service
- Launch of Web / Mobile-based metaverse factory service
- Filing of 2 patents for metaverse

2023

- T-XR, T-AR Metaquest 3 based XR solution launched
- Launch of MetaBlockchain convergence platform (T-Verse)
- Launch of Metaverse City & BIM Platform (K5D Enhance)
- Launch of AI facility automatic placement and simulation
- Launch of AI smart facility predic. DX digital twin solution

Adviance

2022

- TW-2022 Web 3D Monitoring Solution Launch
- Registered as a Tesla Solution Provider

2021

- T-Base' Digital Twin ICT Integrated Control Platform Launch
- Acquired patents related to digital twin

Prepare

2020

- One-Click' Equipment Auto-Placement Tool Launch
- AutoSim3D' 3D Simulation Tool Launch

2019

- K5D' Real-Time Collaborative Hook-Up Piping Design Solution Launch & 3DMaker 3D Modeling Tool Launch

2017

- Development of proprietary OpenGL-based 3D engine technology. Acquired patents related to BIM

Start

2016

- Venture certification

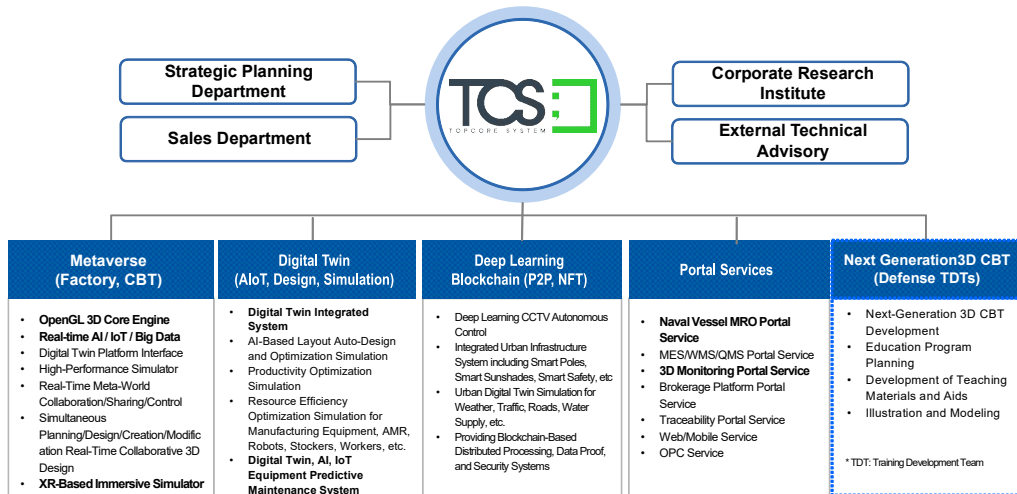
2015

- Establishment of an in-house corporate research institute

2013

- Establishment of the company

II. Company Introduction - Organizational Chart



III. Company Introduction - Proprietary Technologies

Holding patents for Digital Twin, Metaverse, and BIM solution technologies

Digital Twin, Metaverse 3D Engine 'TCS3D'

- Development and supply of domestic 3D engine and API (vs Unity)
- Support for 3D CAD & BIM (vs Autodesk)
- Support for 3D model creation tools (vs 3ds Max)
- **Digital twin-based communication library (Desktop, Web, Mobile)**
- **High-capacity performance (processing 10 million objects) verified by semiconductor 5D BMT**

Simulation Solution 'AutoSim3D'

- AI Equipment Layout Automatic Placement Service
- Production Scheduling and LOB Optimization Simulation Service
- Optimization Simulation Service for AMR, Crane, OHT, and Robot
- **Prediction, Verification, and Analysis Simulation Service**
- Development of XR-Based Optimization Algorithms, AI Integration, and In-House Simulator through National R&D Projects

Digital Twin, Metaverse Platform 'T-Verse'

- Development and supply of a domestic metaverse factory platform through national R&D projects
- **Digital twin platform services**
- **XR-based immersive disaster safety education/training services**
- **Next-generation CBT based on XR and Metaverse**

ICT Convergence (IIoT, AI) Solution 'TBASE'

- Smart City, Smart Factory, Smart Construction ICT Convergence
- Control/Processing Technologies for SCADA, PLC, Motors, IoT, Lighting, MCU Boards, etc.
- Wired/Wireless Communication (TCP, UDP, Modbus, Serial) and DB Integration Technologies

Smart Factory, Smart City Solution 'TMON'

- MES / WMS / SPC / OPC Services
- **3D-Based Reality Integrated Control**
- **AI-Based Equipment Predictive Maintenance**
- Logistics AI and Algorithm-Based Optimal Route Navigation, Optimal Dispatching

Blockchain-Based Cloud Service 'TR-Chain'

- Blockchain Technologies such as Distributed Computing, P2P, and Data Proof
- High-Capacity Encrypted Transmission Compression Technology
- **Clouding Services**

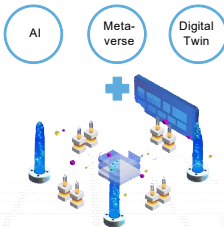
IV. Company Introduction - Capabilities

Overcoming customization limitations for various additional customer needs with proprietary real-time 3D engine development technology



01

Development of Proprietary Domestic Technology



02

Establishment of a Converged Service System based on Digital Twin / Metaverse

Digital Twin Based on Foreign Solutions

High-Cost After-Sales Service Issue
Constraints of Foreign API Interface

Investment in Domestic Digital Twin R&D → Successful Development

With Domestic Products:
Interface
Rapid Response
Affordable
Licensing Policy

Successful Development → Commercialization

Stabilization
Open API R&D → Commercialization

Service Internalization Based on Domestic Platform

Digital Twin
Metaverse
Deep Learning
Blockchain
Clouding

Smart Maintenance System
Smart Factory
Smart City
Integrated Control
Simulation

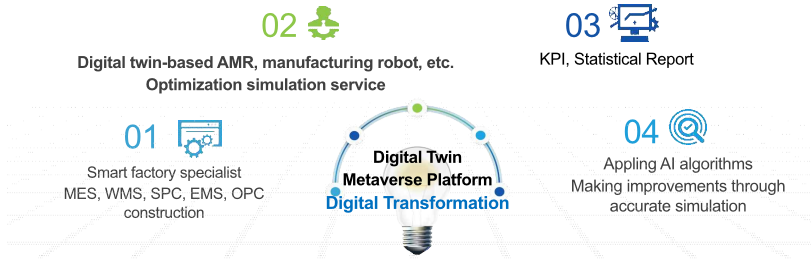
V. Company Introduction - Achievements



Date and Time		Business Details	Client Company
2024	05	- Metaverse Convergence Content Demonstration and Development Project	- Chungbuk Institute of Science and Technology Innovation (ChISTI)
	04	- Digital Twin and XR Demonstration R&D Project for the Materials and Components Industry	- ChISTI
	03	- Construction and Demonstration of Metaverse Factory-Based Line of Balance (LOB) Optimization Simulation Service Platform	- ChISTI
	01	- Construction of a 3D Monitoring System (AutoLMS) through an Automated Engine Based on CAD Drawings	- LG Innotek
- Development of a Digital Twin-Based Finished Vehicle Automated Warehouse Logistics/Storage Verification and Optimization Simulation Service		- Kia Motors	
2023	12	- Development of a Digital Twin-Based Simulation Modeling Automation and Layout Optimization Solution	- LG Innotek
	10	- Development of a Metafactory Blockchain Technology Convergence Service Platform	- ChISTI
	05	- Construction of a Digital Twin-Based IoT-Integrated Smart Equipment Predictive Maintenance System for Production Facilities	- ChISTI
	02	- Digital Twin-Based Hazardous Material Monitoring and Equipment Improvement for Safety and Disaster Management System	- Ministry of SMEs and Startups (MSS)
2022	12	- Development of an Advanced Material Yarn Production Automation Logistics Simulation Service	- Toray Advanced Materials
	09	- Automatic Equipment Layout & Capacity Simulation Service	- LG Innotek
	08	- AGV and Buffer Capacity Optimization 3D Simulation Service	- Hanwha Q CELLS
	06	- Construction of MES and Traceability Portal for Electric Vehicle Parts Manufacturing Line	- Tesla Dongyang Fan
	03	- Establishment of MRO System	- Hyundai Heavy Industries
2021	11	- Establishment of Web3D Locker & Closet reservation management system	- Stats Chip Pack
	06	- Development of virtual 3D nuclear power plant abnormal signal simulator and black box communication module	- Atomic Energy Research Institute

VI. Company Introduction - Business Feasibility

As a company specializing in in-house development, we meticulously prepare for successful project completion. We focus on creating platform services that enhance convenience, accuracy, and efficiency for demanding customers, ensuring top-quality solutions tailored to their needs.



Features and Benefits

01

Providing rapid response to customer needs and customized solutions through a proven domestic digital twin/metaverse platform developed by the proponent company.

The 3D engine developed through national R&D provides various application solutions such as metaverse, digital twin, XR, and IIoT. Rapid response to customer needs through in-house development and provision of customized solutions

Features and Benefits

02

Possession of meta content and provision of realistic education and training services through experience in carrying out projects in various industries

Providing realistic education and training services with experience building digital factories in industries and possessing a large amount of meta content.

Features and Benefits

03

Securing a quality management system such as after-sales service, rapid technical support, customized service, and upgrades through a professional development company

VII. Company Introduction - Execution Capability



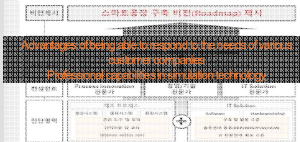
Composed of developers with proprietary solutions, extensive business performance experience, and process understanding
 Provides metaverse, AI, simulation, and digital collaboration technology convergence platform

Possess differentiated next-generation 3D CBT development capabilities with domestically produced 3D engines

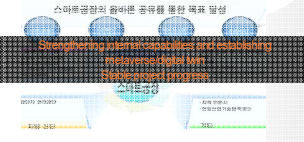
Service Features

- Internalization of specialized metaverse platform
- Advancement through metaverse simulation
- Stable business performance through experience in carrying out numerous similar projects
- Possesses capabilities such as manufacturing innovation and new technology integration through collaboration with related associations
- Providing services in various industries such as automobiles, electrical and electronics, cosmetics, etc.

01 Through business implementation experience of government and private companies
 High level of understanding of each business



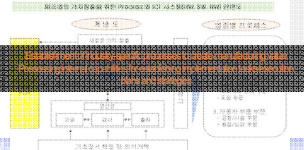
02 Digital twin, smart factory, artificial intelligence, etc.
 Experience in carrying out multiple projects



03 Collaborate with ventures, convergence associations, etc.
 Optimization of discovery of companies introduced in Chungbuk region



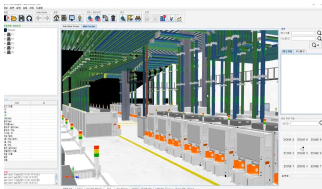
04 DX construction collaboration platform for large and small businesses
 Internal capabilities for verification and performance diffusion



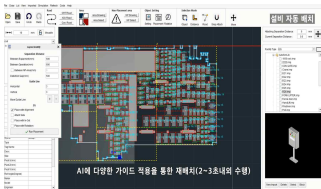
Business Result

- Establishment of a domestic metaverse platform
- Utilize our own differentiated platform focused on performance, flexibility, and compatibility
- Thorough needs analysis of demand companies
- Prediction and verification simulation service analysis to improve productivity and quality
- Consulting for expected effects, performance, and usability through introduction of metafactory
- Establishment of metaverse-based digital collaboration (DX) service
- Building a digital collaboration factory centered on supply chain
- AI convergence simulations

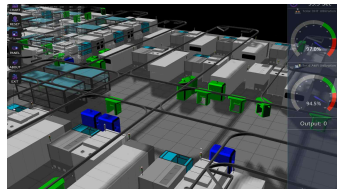
Digital Twin / Metaverse / AI Major Development Cases



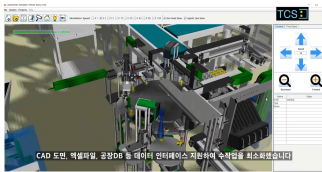
AI-Based BIM Design and Implementation Tools



Digital twin design and construction tool



Semiconductor logistics 3D simulation



Electric vehicle assembly/robot equipment monitoring



Digital twin 3D-based electric car Automatic warehouse monitoring

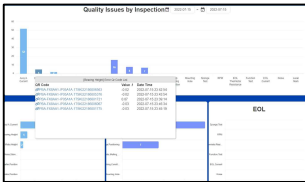


Traffic simulation based on smart city traffic light control

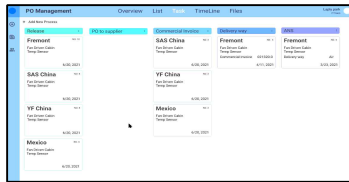
Smart Factory (MES, FMS, QMS, OEE, MRO) System Implementation



Production Status and Quality Dashboard



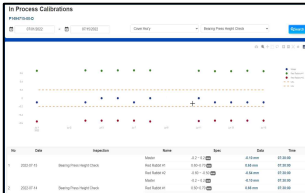
Anomaly Tracking and Issue Management



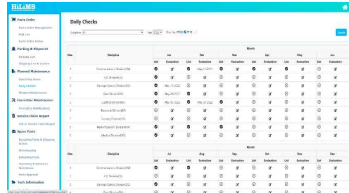
Schedule Management



Quality Status (History) by Product (Component)



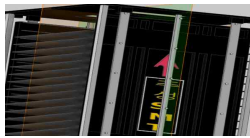
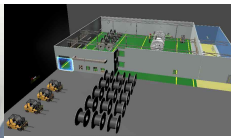
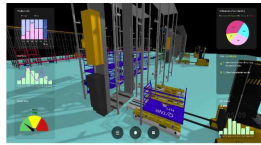
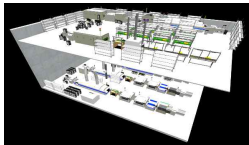
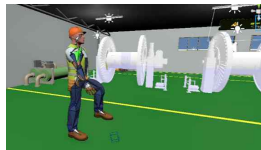
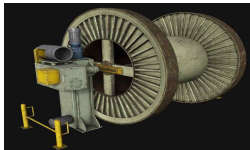
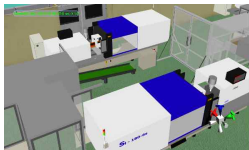
SPC (Statistical Process Control) Management

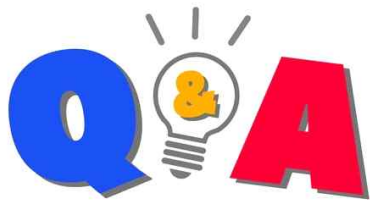


MRO (Maintenance, Repair, and Operations) Management

X. Company Introduction – Content Service Implementation Cases

Metaverse Content Services (Simulation, Monitoring, AI Accident Prevention, Education/Training, Remote Control)





Thank You!