Digital Twin Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The digital twin market is registering a CAGR of 34.48% over the forecast period. The surge in adoption of 3D printing technology, the increasing demand for digital twins in the healthcare and pharmaceutical industries, and the growing propensity toward the adoption of IoT solutions across various industries are anticipated to drive the adoption of such solutions during the forecast period.

Key Highlights
The application of digital twins lies in improving collaboration and workflows across different types of groups, like product design, sales and maintenance teams, and engineering disciplines. For example, the US Airforce has extensively used digital twins to design and build a new aircraft prototype in over a year, a process that traditionally drags on for decades. Further, IoT sensors have created a potential space for engineers to test and communicate with sensors integrated with the operating products, hence delivering real-time prescriptive system functioning and timely maintenance.
Additionally, digital twins technology helps improve physical product design for the entire product lifecycle through pre-analysis of the actual product in its development stage. In the Industrial Internet of Things (IIoT), digital twin technology discovers errors and changes in large machinery equipment through its analytic software connected with IoT components such as smart sensors and networks.
The tools for building digital twins are growing in power and sophistication. It is now possible to design complex what-if simulations, backtrack from detected real-world conditions, and perform millions of simulation processes without overwhelming systems. Further, with the number of vendors increasing, the range of options continues to grow and expand. Moreover, data from real-time asset monitoring technologies such as LiDAR (light detection and ranging) and FLIR (forward-looking infrared) can now be incorporated into digital twin simulations.
Digital Twin, which accumulates data, and intellectual capital, is a concern for enterprise's security, which has become mandatory to various business sectors, which is a challenge for the market. In addition, the connectivity requirement for digital twin operations is obstructing market growth because many enterprises worldwide are yet to update their infrastructure.
The outbreak of the COVID-19 pandemic has provided a new application opportunity for the market, which stands for market

growth adoption. The digital twin technology is gathering momentum in healthcare diagnosis. Digital twins are upending traditional healthcare by modeling conditions and attributes of a particular patient using machine learning data aggregated from a variety of patients.

Digital Twin Market Trends

Surge in Adoption of 3D Printing Technology in Manufacturing Anticipated May Fuel the Demand

3D printing technology has already brought revolutionary changes in the manufacturing industry through its fast-model building capability and flexible printing materials. With the introduction of digital twin technology, the advantage of 3D printing has gone even more ahead in various manufacturing industries such as automotive, aerospace, medical, and utility industries.
Vendors in the market are involved in partnerships and collaborations to integrate their 3D printing capability with digital twin technology. They are targeting to lower the production and manufacturing costs through pre-testing and predictive analysis of goods.
Using software such as Netfabb and Siemens NX, manufacturers can conduct simulations and tests on the digital twin and eliminate the need for multiple physical prototypes. Using sensor data, manufacturers can track and trace the conditions inside the 3D printer, making a part. With every new layer and data source, the digital twin becomes complete.
Digital twins can also be used for the creation of 3D printers themselves. For instance, Siemens helped HP create a digital twin of its Jet Fusion 5200 3D printer to help simulate airflow patterns through the machine. The data generated allowed HP to optimize its cooling channel topology for ideal ventilation.
Several developed and developing nations are focused on leveraging their 3D printing adoption with the implementation of digital twin technology. The United States, China, Japan, China, Germany, and the United Kingdom are some of the significant countries adopting this technology with their existing base in the 3D printing industry.

North America Holds a Significant Market Share

North America dominates the IoT industry in aerospace, automotive, and manufacturing. This region has developed economies like the United States and Canada, where massive investments are found in R&D activities, thus contributing to developing new technologies such as smart sensors, edge analytics, 3D printing, and digital twin.
While manufacturing has begun to embrace digital twin technology, construction remains largely a 2D industry and one that hungers for technological innovation. With 3D visual digital twin technology, off-site experts can now access on-site views into the nitty-gritty of the project taking off where Google street view ends.
In June 2021, Cupix announced the availability of CupixWorks 2.0, a significant update to its leading product, CupixWorks. CupixWorks 2.0 is the industry's most advanced 3D digital twin platform, enabling building owners, general contractors, and project managers to build smarter, transforming any construction site into an easy-to-manage project and creating value across the entire life cycle of a property.
Further, it has been expected that the increased demand for digital twins by owners and operators of buildings and infrastructure will create new market opportunities for digital technologies and digitization of the AEC industry. Autodesk has been on a tear, expanding its support for digital twins across the building industry. For starters, Autodesk launched Tandem, a digital twin platform that promises to connect the dots between project owners and architectural, engineering, and contracting (AEC) teams.
In March 2021, Ansys, a company from the USA, and GlobalFoundries (GF) collaborated to offer silicon photonics solutions to address the growth of data volumes while significantly reducing power consumption. The companies would also deliver solutions that expand photonic design capabilities in data centers, optical networking, supercomputing, fiber optics, 5G connectivity, and

aerospace and defense applications. Ansys and GF would also enable innovative silicon photonic (SiPh) chip design workflows for a custom component design using Ansys' photonics simulation tools.

Digital Twin Market Competitor Analysis

As many regional and global players dominate the market with their technological expertise in digital twin solutions, the global market for digital twins is expected to be fragmented. Companies are involved in competitive strategic developments in the market, such as partnerships, new product innovations, and expansion, to gain leadership positions in the global market.

June 2021 - FARO Technologies Inc. announced the acquisition of HoloBuilder. HoloBuilder's SaaS platform will add fast and easy reality-capture photo documentation and remote access capability to FARO's highly accurate 3D point cloud-based laser scanning to create the industry's first end-to-end Digital Twin solution.
March 2021 - The Lamina Tower, an ultra-luxury residential condominium tower in the Middle East, partnered with Cityzenith LLC to create a multi-purpose digital twin using the SmartWorldOS Digital Twin desktop application to create a 3D view of the property and surroundings, along with other requirements.
June 2021, Waylay announced that it had partnered with top-tier Salesforce Implementation Partners for Waylay Digital Twin, its powerful no-code IoT asset monitoring solution for Salesforce. The selected implementation partners boost consulting and implementation capacity and bring decades of Salesforce expertise to the Waylay Digital Twin projects.

Additional Benefits:

 The market estimate (ME) sheet in Excel format
3 months of analyst support

Table of Contents:

1 INTRODUCTION
1.1 Study Assumptions and Market Definition
1.2 Scope of the Study

2 RESEARCH METHODOLOGY

3 EXECUTIVE SUMMARY

4 MARKET INSIGHTS
4.1 Market Overview
4.2 Industry Attractiveness - Porter's Five Forces Analysis
4.2.1 Threat of New Entrants
4.2.2 Bargaining Power of Buyers
4.2.3 Bargaining Power of Suppliers
4.2.4 Threat of Substitute Products
4.2.5 Intensity of Competitive Rivalry
4.3 Industry Value Chain Analysis
4.4 Assessment of the Impact of COVID-19 on the Market

5 MARKET DYNAMICS

5.1 Market Drivers

5.1.1 Growth in IoT and Cloud-based Platforms

5.1.2 Surge in Adoption of 3D Printing Technology in the Manufacturing Industry

5.1.3 Objective to Reduce Project Cost

5.2 Market Restraints

5.2.1 Inadequate Infrastructure in Under-developed Countries and Data Security-related Concerns

6 MARKET SEGMENTATION

6.1 Application

6.1.1 Manufacturing

6.1.2 Energy and Power

6.1.3 Aerospace

6.1.4 Oil and Gas

6.1.5 Automobile

6.1.6 Others Applications

6.2 Geography

6.2.1 North America

6.2.1.1 United States

6.2.1.2 Canada

6.2.2 Europe

6.2.2.1 United Kingdom

6.2.2.2 Germany

6.2.2.3 France

6.2.2.4 Rest of Europe

6.2.3 Asia-Pacific

6.2.3.1 China

6.2.3.2 Japan

6.2.3.3 India

6.2.3.4 Rest of Asia-Pacific

6.2.4 Rest of the World

7 COMPETITIVE LANDSCAPE

7.1 Company Profiles

7.1.1 ANSYS Inc.

7.1.2 Cal-Tek SRL

7.1.3 Cityzenith Inc.

7.1.4 General Electric Company

7.1.5 IBM Corporation

7.1.6 Lanner Group Limited (Royal Haskoning DHV)

7.1.7 Mevea Ltd

7.1.8 Microsoft Corporation

7.1.9 Rescale Inc.

7.1.10 SAP SE

8 INVESTMENT ANALYSIS

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