

# **North America Computer Aided Engineering Market Size and Forecast (2021 - 2031), Regional Share, Trend, and Growth Opportunity Analysis Report Coverage: By Component (Software and Services), Software Type [Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), Multibody Dynamics, and Optimization and Simulation], Deployment Model (On-Premise and Cloud-based), and End Use Industry (Automotive, Defense and Aerospace, Electronics, Medical Devices, Industrial Equipment, and Others)**

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## **Abstracts**

The North America Computer Aided Engineering (CAE) market is projected to grow significantly, reaching approximately US\$ 8,054.5 million by 2031, up from US\$ 4,019.9 million in 2024. This growth represents a compound annual growth rate (CAGR) of 10.9% from 2025 to 2031.

### **Executive Summary and Market Analysis**

North America is recognized as a hub for advanced technology, particularly in sectors such as aerospace, automotive, defense, and electronics. Major companies like Boeing, General Motors, and Lockheed Martin leverage simulation software to improve product performance, minimize prototyping costs, and expedite development cycles. The integration of CAE with cutting-edge technologies such as artificial intelligence (AI), machine learning (ML), and digital twin platforms enhances predictive simulations and streamlines design processes. Government initiatives, particularly from organizations like NASA and the U.S. Department of Defense, further stimulate innovation through

funding for advanced engineering research.

The region also boasts a robust ecosystem of skilled engineers and prestigious universities, ensuring a continuous demand for simulation tools in both academic and commercial sectors. Regulatory requirements compel industries to adhere to stringent safety and environmental standards, which in turn increases the reliance on virtual testing and validation methods.

#### Recent Developments

In a notable development, Stratasys Ltd. announced the establishment of the North American Stratasys Tooling Center (NASTC) in collaboration with Automation Intelligence, LLC, in Flint, Michigan, on June 12, 2025. This facility is designed to assist manufacturers in evaluating and adopting additive manufacturing for production tooling applications, utilizing advanced 3D printing technologies like the Stratasys F3300 and F900. These systems facilitate hands-on engineering to create tooling solutions such as jigs, fixtures, and end-of-arm tooling, particularly benefiting the automotive and industrial sectors by enhancing operational efficiency and reducing costs.

Additionally, on March 18, 2025, NVIDIA revealed that CAE software vendors, including Ansys, Altair, Cadence, Siemens, and Synopsys, are enhancing simulation performance by up to 50 times using the NVIDIA Blackwell platform. This advancement, powered by CUDA-X libraries, allows industries such as automotive, aerospace, energy, and manufacturing to shorten development timelines, improve simulation accuracy, and lower costs while maintaining energy efficiency. These innovations highlight a broader trend in North America where the integration of advanced hardware and software is propelling the growth of the CAE market by enabling faster, more cost-effective, and accurate engineering processes.

#### Market Segmentation

The North America CAE market is segmented by various factors:

**By Component:** The market is divided into Software and Services, with Software holding the largest share in 2024.

**By Software Type:** It includes Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), Multibody Dynamics, and Optimization and Simulation, where FEA dominated in 2024.

**By Deployment Model:** The market is categorized into On-Premise and Cloud-based, with On-Premise solutions leading in 2024.

**By End Use Industry:** Segments include Automotive, Defense and Aerospace, Electronics, Medical Devices, Industrial Equipment, and Others, with Automotive

being the largest segment in 2024.

## Market Outlook

The proliferation of IoT devices in industrial settings generates vast amounts of real-time operational data from sensors embedded in machinery, vehicles, and infrastructure. This continuous data stream allows CAE models to be dynamically updated, ensuring simulations accurately reflect the current state of physical assets. By integrating real-time sensor data into simulation environments, IoT enhances predictive maintenance strategies, enabling the identification and mitigation of potential failures before they occur, thus reducing downtime and maintenance costs.

Digital twins, which are powered by CAE simulations enriched with IoT data, provide insights into the operational characteristics of complex systems. They allow engineers to conduct virtual experiments, test modifications, and predict outcomes under various conditions without disrupting physical operations. This capability accelerates product development cycles and improves reliability by identifying design weaknesses early in the process. Furthermore, digital twins support lifecycle management by continuously updating models based on incoming data, facilitating ongoing optimization and informed decision-making.

The convergence of CAE, IoT, and digital twins is transformative across sectors such as aerospace, automotive, manufacturing, and energy, where the complexity of systems and the need for operational reliability demand advanced simulation-driven insights. For instance, in smart manufacturing, CAE-integrated digital twins create intelligent production lines that optimize and diagnose themselves, enhancing efficiency and reducing waste. In product development, manufacturers can use digital twins to dynamically customize products and anticipate field performance, significantly improving customer satisfaction.

The integration of IoT and digital twin technologies with CAE platforms signifies a shift towards more intelligent, connected, and adaptive engineering solutions, driving the adoption of CAE by demonstrating clear value in operational efficiency and product innovation.

## Contents

### **1. INTRODUCTION**

- 1.1 Report Guidance
- 1.2 Market Segmentation

### **2. EXECUTIVE SUMMARY**

- 2.1 Key Insights
- 2.2 Market Attractiveness

### **3. RESEARCH METHODOLOGY**

- 3.1 Secondary Research
- 3.2 Primary Research
  - 3.2.1 Hypothesis formulation:
  - 3.2.2 Macroeconomic factor analysis:
  - 3.2.3 Developing base number:
  - 3.2.4 Data Triangulation:
  - 3.2.5 Country-level data:

### **4. COMPUTER AIDED ENGINEERING MARKET LANDSCAPE**

- 4.1 Market Overview
- 4.2 PEST Analysis
- 4.3 Ecosystem Analysis
  - 4.3.1 Software Providers
  - 4.3.2 Hardware and Infrastructure Providers
  - 4.3.3 End-Use Industry
  - 4.3.4 List of Vendors in the Value Chain

### **5. NORTH AMERICA COMPUTER AIDED ENGINEERING MARKET - KEY MARKET DYNAMICS**

- 5.1 Market Drivers
- 5.2 Market Restraints
- 5.3 Market Opportunities
- 5.4 Future Trends

5.5 Impact of Drivers and Restraints:

## **6. COMPUTER AIDED ENGINEERING MARKET - NORTH AMERICA MARKET ANALYSIS**

6.1 North America Computer Aided Engineering Market Revenue (US\$ Million), 2024 - 2031

6.2 North America Computer Aided Engineering Market Forecast and Analysis

## **7. NORTH AMERICA COMPUTER AIDED ENGINEERING MARKET REVENUE ANALYSIS - BY COMPONENT**

7.1 Software

7.1.1 Overview

7.1.2 Software: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

7.2 Services

7.2.1 Overview

7.2.2 Services: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

## **8. NORTH AMERICA COMPUTER AIDED ENGINEERING MARKET REVENUE ANALYSIS - BY SOFTWARE TYPE**

8.1 Finite Element Analysis (FEA)

8.1.1 Overview

8.1.2 Finite Element Analysis (FEA): North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

8.2 Computational Fluid Dynamics (CFD)

8.2.1 Overview

8.2.2 Computational Fluid Dynamics (CFD): North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

8.3 Multibody Dynamics

8.3.1 Overview

8.3.2 Multibody Dynamics: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

8.4 Optimization and Simulation

8.4.1 Overview

8.4.2 Optimization and Simulation: North America Computer Aided Engineering Market

- Revenue and Forecast, 2021 - 2031 (US\$ Million)

## **9. NORTH AMERICA COMPUTER AIDED ENGINEERING MARKET REVENUE ANALYSIS - BY DEPLOYMENT MODEL**

### 9.1 On-Premise

#### 9.1.1 Overview

9.1.2 On-Premise: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

### 9.2 Cloud-based

#### 9.2.1 Overview

9.2.2 Cloud-based: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

## **10. NORTH AMERICA COMPUTER AIDED ENGINEERING MARKET REVENUE ANALYSIS - BY END USE INDUSTRY**

### 10.1 Automotive

#### 10.1.1 Overview

10.1.2 Automotive: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

### 10.2 Defense and Aerospace

#### 10.2.1 Overview

10.2.2 Defense and Aerospace: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

### 10.3 Electronics

#### 10.3.1 Overview

10.3.2 Electronics: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

### 10.4 Medical Devices

#### 10.4.1 Overview

10.4.2 Medical Devices: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

### 10.5 Industrial Equipment

#### 10.5.1 Overview

10.5.2 Industrial Equipment: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

### 10.6 Others

#### 10.6.1 Overview

10.6.2 Others: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

## **11. NORTH AMERICA COMPUTER AIDED ENGINEERING MARKET - COUNTRY ANALYSIS**

### 11.1 North America

11.1.1 North America Computer Aided Engineering Market Revenue and Forecast and Analysis - by Country

11.1.1.1 North America Computer Aided Engineering Market Revenue and Forecast and Analysis - by Country

11.1.2.2 United States: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

11.1.2.2.1 United States: North America Computer Aided Engineering Market Share - by Component

11.1.2.2.2 United States: North America Computer Aided Engineering Market Share - by Software Type

11.1.2.2.3 United States: North America Computer Aided Engineering Market Share - by Deployment Model

11.1.2.2.4 United States: North America Computer Aided Engineering Market Share - by End Use Industry

11.2.3.3 Canada: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

11.2.3.3.1 Canada: North America Computer Aided Engineering Market Share - by Component

11.2.3.3.2 Canada: North America Computer Aided Engineering Market Share - by Software Type

11.2.3.3.3 Canada: North America Computer Aided Engineering Market Share - by Deployment Model

11.2.3.3.4 Canada: North America Computer Aided Engineering Market Share - by End Use Industry

11.3.4.4 Mexico: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

11.3.4.4.1 Mexico: North America Computer Aided Engineering Market Share - by Component

11.3.4.4.2 Mexico: North America Computer Aided Engineering Market Share - by Software Type

11.3.4.4.3 Mexico: North America Computer Aided Engineering Market Share - by Deployment Model

11.3.4.4.4 Mexico: North America Computer Aided Engineering Market Share - by End Use Industry

## **12 COMPETITIVE LANDSCAPE**

- 12.1 Heat Map Analysis by Key Players
- 12.2 Company Positioning & Concentration

## **13 INDUSTRY LANDSCAPE**

- 13.1 Overview
- 13.2 New Product Development
- 13.3 Merger and Acquisition
- 13.4 Other Strategic Developments

## **14 COMPANY PROFILES**

- 14.1 Dassault Systemes SE
  - 14.1.1 Key Facts
  - 14.1.2 Business Description
  - 14.1.3 Products and Services
  - 14.1.4 Financial Overview
  - 14.1.5 SWOT Analysis
  - 14.1.6 Key Developments
- 14.2 Siemens AG
  - 14.2.1 Key Facts
  - 14.2.2 Business Description
  - 14.2.3 Products and Services
  - 14.2.4 Financial Overview
  - 14.2.5 SWOT Analysis
  - 14.2.6 Key Developments
- 14.3 PTC Inc
  - 14.3.1 Key Facts
  - 14.3.2 Business Description
  - 14.3.3 Products and Services
  - 14.3.4 Financial Overview
  - 14.3.5 SWOT Analysis
  - 14.3.6 Key Developments
- 14.4 Autodesk Inc

- 14.4.1 Key Facts
- 14.4.2 Business Description
- 14.4.3 Products and Services
- 14.4.4 Financial Overview
- 14.4.5 SWOT Analysis
- 14.4.6 Key Developments
- 14.5 Hexagon AB
  - 14.5.1 Key Facts
  - 14.5.2 Business Description
  - 14.5.3 Products and Services
  - 14.5.4 Financial Overview
  - 14.5.5 SWOT Analysis
  - 14.5.6 Key Developments
- 14.6 Bentley Systems Inc
  - 14.6.1 Key Facts
  - 14.6.2 Business Description
  - 14.6.3 Products and Services
  - 14.6.4 Financial Overview
  - 14.6.5 SWOT Analysis
  - 14.6.6 Key Developments
- 14.7 Altair Engineering, Inc.
  - 14.7.1 Key Facts
  - 14.7.2 Business Description
  - 14.7.3 Products and Services
  - 14.7.4 Financial Overview
  - 14.7.5 SWOT Analysis
  - 14.7.6 Key Developments
- 14.8 Ansys Inc
  - 14.8.1 Key Facts
  - 14.8.2 Business Description
  - 14.8.3 Products and Services
  - 14.8.4 Financial Overview
  - 14.8.5 SWOT Analysis
  - 14.8.6 Key Developments
- 14.9 Satven
  - 14.9.1 Key Facts
  - 14.9.2 Business Description
  - 14.9.3 Products and Services
  - 14.9.4 Financial Overview

14.9.5 SWOT Analysis

14.9.6 Key Developments

14.10 Technosoft Engineering Projects Ltd.

14.10.1 Key Facts

14.10.2 Business Description

14.10.3 Products and Services

14.10.4 Financial Overview

14.10.5 SWOT Analysis

14.10.6 Key Developments

## **15. APPENDIX**

15.1 About The Insight Partners

## List Of Tables

### LIST OF TABLES

Table 1. North America Computer Aided Engineering Market Segmentation

Table 2. List of Vendors

Table 3. North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Table 4. North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Component

Table 5. North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Software Type

Table 6. North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Deployment Model

Table 7. North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by End Use Industry

Table 8. North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Country

Table 9. United States: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Component

Table 10. United States: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Software Type

Table 11. United States: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Deployment Model

Table 12. United States: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by End Use Industry

Table 13. Canada: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Component

Table 14. Canada: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Software Type

Table 15. Canada: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Deployment Model

Table 16. Canada: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by End Use Industry

Table 17. Mexico: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Component

Table 18. Mexico: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million) - by Software Type

Table 19. Mexico: North America Computer Aided Engineering Market - Revenue and

Forecast, 2021 - 2031 (US\$ Million) - by Deployment Model

Table 20. Mexico: North America Computer Aided Engineering Market - Revenue and

Forecast, 2021 - 2031 (US\$ Million) - by End Use Industry

Table 21. Heat Map Analysis by Key Players

## List Of Figures

### LIST OF FIGURES

Figure 1. North America Computer Aided Engineering Market Segmentation - Country

Figure 2. PEST Analysis

Figure 3. Ecosystem: Computer Aided Engineering Market

Figure 4. North America Computer Aided Engineering Market - Key Market Dynamics

Figure 5. Impact Analysis of Drivers and Restraints

Figure 6. North America Computer Aided Engineering Market Revenue (US\$ Million), 2024 - 2031

Figure 7. North America Computer Aided Engineering Market Share (%) - by Component, 2024 and 2031

Figure 8. Software: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 9. Services: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 10. North America Computer Aided Engineering Market Share (%) - by Software Type, 2024 and 2031

Figure 11. Finite Element Analysis (FEA): North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 12. Computational Fluid Dynamics (CFD): North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 13. Multibody Dynamics: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 14. Optimization and Simulation: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 15. North America Computer Aided Engineering Market Share (%) - by Deployment Model, 2024 and 2031

Figure 16. On-Premise: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 17. Cloud-based: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 18. North America Computer Aided Engineering Market Share (%) - by End Use Industry, 2024 and 2031

Figure 19. Automotive: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 20. Defense and Aerospace: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 21. Electronics: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 22. Medical Devices: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 23. Industrial Equipment: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 24. Others: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 25. North America Computer Aided Engineering Market Breakdown by Key Countries, 2024 and 2031 (%)

Figure 26. United States: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 27. Canada: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 28. Mexico: North America Computer Aided Engineering Market - Revenue and Forecast, 2021 - 2031 (US\$ Million)

Figure 29. Company Positioning & Concentration

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