Structural Health Monitoring Market Size, Share, Competitive Landscape and Trend Analysis Report

Structural Health Monitoring Market Size was valued at $1,674.0 million in 2019 and is projected to reach $3,815.1 million by 2027

WILMINGTON, DELAWARE, UNITED STATES, April 25, 2024 /EINPresswire.com/ -- Global Structural Health Monitoring Market was valued at $1,674.0 million in 2019 and is expected to reach $3,815.1 million by 2027, with a Compound Annual Growth Rate (CAGR) of 14.5% from 2020 to 2027. Structural Health Monitoring (SHM) involves gathering and analyzing data from various connected sensors throughout a structure or equipment's lifespan. This method helps in identifying and measuring the object's deterioration, aiding in predicting repair and maintenance needs without causing damage.

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Overview

Over time, SHM has emerged as a promising field within civil engineering, playing a crucial role in designing, analyzing, and maintaining modern civil structures. The market's growth is fueled by increasing attention to SHM, aging infrastructure in Europe and North America, outdated aircraft fleets, cost-effective inspections, and frequent natural disasters. Investments in infrastructure and advancements in wireless sensor networks also present significant opportunities for the global SHM market. However, high costs and data normalization challenges hinder market growth.

Market Dynamics

Globally, SHM for civil structures is gaining traction in construction management and maintenance. It reduces inspection costs and research time while providing insights into structural behavior under dynamic loads and seismic activities in real or near-real-time. SHM aids in post-earthquake management and rescue operations. Monitoring static and dynamic stresses on dams has also become vital due to their structural responses' negative impacts.

Actual dam responses often differ from design predictions due to environmental factors, construction types, modeling assumptions, and design variations.

Government focus on technological adoption drives SHM system implementation. For example, the European government's Transport and Research and Innovation Monitoring and Information System (TRIMIS) program supported the COST Action TU1402 from 2014 to 2019. This action aimed to showcase SHM's high value and societal impact, resulting in up to 90% operational cost reduction and improved reliability and safety.

Infrastructure development is crucial for a country's progress, prompting governments worldwide to invest in projects like roads, railways, and airports. For instance, Dubai and India collaborated on infrastructure projects in Jammu & Kashmir in October 2021. In November 2021, the U.S. approved a $1.2 trillion infrastructure bill, which will likely boost SHM demand.

Additionally, the growing purchasing power in developing countries boosts the aviation industry. For example, Airbus SE delivered 661 commercial aircraft in 2022 and received orders for 1,078 more. This growth positively impacts the SHM market as these systems monitor aircraft structural health in real-time, predicting maintenance needs.

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Market Segmentation

By Component:

Hardware

Software

Services (Projected to grow at a significant CAGR)

By End User:

Civil

Aerospace

Defense

Mining

Energy

Others

By Connectivity:

Wired

Wireless (Projected to grow at a significant CAGR)

By Region:

North America (U.S., Canada, Mexico)

Europe (Germany, UK, France, Italy, rest of Europe)

Asia-Pacific (China, Japan, India, rest of Asia-Pacific)

LAMEA (Latin America, Middle East, Africa)

Competition Analysis

Key players in the SHM market include National Instruments Corporation, Advitam Inc., Digitexx Data Systems, Inc., Acellent Technologies, Inc., Nova Metrix LLC, COWI A/S, Geocomp Corporation, Hottinger Baldwin Messtechnik GmbH, Strainstall UK Limited, and Kinemetrics Inc. These companies focus on product launches, partnerships, and expansions to meet consumer demands.

For instance, Strainstall UK Limited launched load shackles for Marine Energy's PLAT_I tidal energy project, enhancing turbine condition monitoring under extreme conditions.

Regional Insights

Asia-Pacific dominated the SHM market in 2019, while LAMEA is expected to grow at the highest rate during the forecast period.

Key Benefits for Stakeholders

Comprehensive analysis of SHM market trends and dynamics.

Detailed market estimations for key segments from 2019 to 2027.

In-depth analysis of top competitors and their strategies.

Regional analysis to identify prevailing opportunities.

Forecast analysis from 2020 to 2027.

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