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Structural health monitoring Market by Offering (Hardware, Software & Services), Technology (Wired, Wireless), Vertical (Civil Infrastructure, Aerospace & Defense, Energy, Mining), Implementation, Application and Region - Global Forecast to 2029

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Abstracts

The global structural health monitoring market was valued at USD 2.5 billion in 2024 and is projected to reach USD 4.1 billion by 2029; it is expected to register a CAGR of 10.4% during the forecast period. The market's growth is driven by several key factors, including the rising significance of automated maintenance and repair for critical infrastructures, the far-reaching consequences of structural failures leading to loss of lives and capital, substantial investments in the infrastructure sector, stringent government regulations promoting sustainable construction practices, aging infrastructure prompting the adoption of structural health monitoring, and the cost efficiencies associated with the structural health monitoring industry.

“The hardware segment to hold the largest share during the forecast period.”

The hardware segment is anticipated to hold the largest share of the structural health monitoring market, primarily due to its integral role in measuring the physical properties of structures under surveillance. Within the hardware segment, sensors play a crucial role in collecting data for structural health monitoring systems. Wired structural health monitoring systems, which involve physical connections between sensors and data acquisition systems, are known for their stability and accuracy in data acquisition, making them a preferred choice for critical infrastructure monitoring applications.

“the wired technology segment to record largest market share during the forecast period.”

The wired technology holds a substantial market share in structural health monitoring. Wired systems establish physical connections between sensors and data acquisition units, providing a dependable and well-established approach to monitoring structural integrity. This method is frequently employed for overseeing extensive structures with stringent safety and durability criteria such as bridges, buildings, chimneys, offshore platforms, and nuclear facilities. Wired solutions are recognized for their stability and precision in data collection, making them a favored option for critical infrastructure monitoring where reliability and accuracy are paramount.

“The Aerospace & Defence is likely to grow at the highest CAGR during the forecast period.”

The Aerospace & Defense vertical is expected to experience highest market growth in the field of structural health monitoring. This growth is attributed to the non-destructive inspection of critical components in the aerospace industry to ensure safety and reliability. Companies like Testia and CURTISS-WRIGHT are prominent players in this sector, emphasizing the importance of structural health monitoring for aerospace applications. The rise in investments in infrastructure, particularly in the aerospace and defense sectors, is driving the demand for advanced monitoring systems to enhance safety and operational efficiency

“The Europe segment is likely to grow at the third highest CAGR during the forecast period.”

The European market for structural health monitoring market is experiencing significant growth, primarily attributed to several factors. The European structural health monitoring (SHM) market is poised for substantial growth due to multiple converging factors. Firstly, aging infrastructure across Europe, including bridges and transportation networks, necessitates proactive management through SHM to detect issues early and prevent costly failures. Secondly, increased government investment in infrastructure renovation projects presents opportunities for integrating SHM solutions to ensure infrastructure longevity and safety. Thirdly, stringent safety regulations drive the demand for SHM by providing continuous monitoring data to ensure compliance and prioritize public safety. Furthermore, SHM contributes to sustainability goals by extending the lifespan of structures and optimizing resource utilization. Technological advancements in sensor technology and digitalization in construction enhance the accessibility and integration of SHM solutions. Additionally, growing awareness and expertise, focus on non-destructive testing, cost benefits, and applications beyond traditional infrastructure further fuel the growth of the SHM market in Europe.

Breakdown of primaries

The study contains insights from various industry experts, ranging from component suppliers to Tier 1 companies and OEMs. The break-up of the primaries is as follows:

By Company Type - Tier 1 – 50%, Tier 2 – 30%, Tier 3 – 20%

By Designation— C-level Executives - 35%, Directors - 30%, Others - 35%

By Region—North America - 40%, Europe - 25%, Asia Pacific - 20%, RoW - 15%

The structural health monitoring market is dominated by a few globally established players such as COWI A/S (Denmark), Campbell Scientific (US), Geokon (US), Nova Metrix LLC (US), SGS SA (Switzerland), Trimble Inc. (US), Structural Monitoring Systems PLC (Australia), Sixense (France), Digitexx Data Systems, Inc. (US), and Acellent Technologies, Inc. (US). The study includes an in-depth competitive analysis of these key players in the structural health monitoring market, with their company profiles, recent developments, and key market strategies.

Research Coverage:

The report segments the structural health monitoring market and forecasts its size by offering, by technology, implementation, application, vertical, and region. The report also discusses the drivers, restraints, opportunities, and challenges pertaining to the market. It gives a detailed view of the market across four main regions—North America, Europe, Asia Pacific, and RoW. Supply chain analysis has been included in the report, along with the key players and their competitive analysis in the structural health monitoring ecosystem.

Key Benefits to Buy the Report:

Analysis of key drivers (automation in maintenance & repair of infrastructure, loss of life and capital due to structural failures, increasing infrastructure investments,government regulations pertaining to sustainable structures, aging infrastructure and benefits associated with structural health monitoring, reduced costs of structural health monitoring systems). Restraint (high installation and monitoring costs, inaccurate results owing to errors in readings, slow adoption of structural health monitoring in developing countries). Opportunity (integration of advanced solutions for structural health monitoring, growing opportunities in Asia Pacific and GCC countries, advancements in sensor technologies, increasing investments in oil & gas and major energy projects). Challenges (dearth of skilled operators for installation and calibration of instruments, poor site conditions, technical challenges and operational factors, processing and management of large volumes of data)

Product Development/Innovation: Detailed insights on upcoming technologies, research and development activities, and new productand services launches in the structural health monitoring market.

Market Development: Comprehensive information about lucrative markets – the report analyses the structural health monitoring market across varied regions

Market Diversification: Exhaustive information about new products and services, untapped geographies, recent developments, and investments in the structural health monitoring market.

Competitive Assessment: In-depth assessment of market shares, growth strategies, and service offerings of leading players like COWI A/S (Denmark), Campbell Scientific (US), Geokon (US), Nova Metrix LLC (US), SGS SA (Switzerland), Trimble Inc. (US), Structural Monitoring Systems PLC (Australia), Sixense (France), Digitexx Data Systems, Inc. (US), and Acellent Technologies, Inc. (US) among others in the structural health monitoring market.

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*Details on Business Overview, Products/Solutions/Services Offered, Recent Developments, and MnM View (Key strengths/Right to Win, Strategic Choices Made, and Weaknesses and Competitive Threats) might not be captured in case of unlisted companies.

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