Military 4D Printing Market is Experiencing Rapid Growth, Presently Valued At $673.4 million with a CAGR of 45.2%

Rise in adoption of lightweight components are expected to drive the military 4D printing industry growth

Military 4D Printing Market

WILMINGTON, NEW CASTLE, DELAWARE, UNITED STATES, May 8, 2024 /EINPresswire.com/ -- [□□□□□□□□□ □□ □□□□□□□□ □□□□□□□] by Technique (Fused deposition modeling (FDM), Stereolithography (SLA), Selective laser sintering (SLS) and selective laser melting (SLM), Others), by Material (Hydrogels, Thermo-responsive, Photo-responsive, Electro & magneto responsive, Others), by Properties (Self-assembly, Self-repair, Self-adaptability), by Application (Army, Navy, Air Force): Global Opportunity Analysis and Industry Forecast, 2030-2040". According to the report, the global military 4D printing industry is estimated to generate $16.1 million in 2030, and is anticipated to generate $673.4 million by 2040, witnessing a CAGR of 45.2% from 2030 to 2040.

> By technique, the fused deposition modeling (FDM) segment is expected to dominate the global Military 4D Printing market in 2030”
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> *Allied Market Research*

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4D printing is an advancement of 3D printing technology that creates 3D shapes that can change in form when triggered by environmental stimuli. The purpose of this technology is to combine technology and design to invent self-assembly and programmable material technologies aiming at reimagining construction, manufacturing, product assembly, and performance. This printed object can change shape due to many factors such as air, heat, pressure, and magnetism. Although this technology is predominantly still in the research stages, it has already been used for several useful applications. Currently, the surge in investments by armed forces to simplify weapons & equipment in the defense industry along with high demand

for lightweight parts is likely to help armies gain an upper hand, which is expected to drive the 4D printing market growth for military applications.

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Factors such as surge in military application to boost the product demand, increase in investments by armed forces into technology, and rise in adoption of lightweight components are expected to drive the market growth. However, complex design of both hardware & software section and lack of standardization in process are some of the factors that hinder the market growth. Furthermore, technological advancements & rise in demand for Industry 4.0 and emergence of Industry 5.0 are expected to offer lucrative opportunities for military 4D printing market growth.

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Based on technique, the fused deposition modeling (FDM) segment is expected to hold the highest market share in 2030, accounting for nearly two-fifths of the global military 4D printing market, and is estimated to maintain its leadership status throughout the forecast period. this is attributed to advantages associated with FDM technology including high speed, accuracy, low cost of production, expiring patents, availability of multiple color options, easy-to-maintain attribute, lightweight, endurance to heat, chemicals, dry & humid environment, and negligible hazardous waste generation. However, the stereolithography (SLA) segment is projected to manifest the highest CAGR of 47.7% from 2030 to 2040, due to use of a wide range of materials, high resolution, shortened development cycles, high accuracy, and durable outputs.

Based on application, the army segment is expected to account for the largest share in 2030, contributing to nearly half of the global military 4D printing market, and is projected to maintain its lead position during the forecast period. This is attributed to increased demand for advanced weapons to be present with the army across the globe. However, the navy segment is expected to portray the largest CAGR of 47.3% from 2030 to 2040, due to the increased trend toward upgradation of naval services across the globe.

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Based on region, North America is expected to hold the highest market share in terms of revenue in 2030, accounting for around two-fifths of the global military 4D printing market.

Increase in investment in arm forces in the U.S. to establish dominance on the battlefield drive the market growth. However, the Asia-Pacific region is expected to witness the fastest CAGR of 49.1% from 2030 to 2040. This is due to rise in defense expenditure across the region to tackle growing terrorism and regional disputes in countries such as India, South Korea, and China.

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In addition, the military 4D printing market size has witnessed significant growth in recent years, owing to investments by several nations in producing guns, machinery, and other defense technologies. In addition, constant advancements in material science & simulation software capabilities, which empower a range of materials to be programmed to change their form, appearance, or other characteristics, propel the demand for 4D printing technology for military applications. Furthermore, the companies operating in the military 4D printing market have adopted several contracts, investments, and product launches to increase their market share and expand their geographical presence

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By technique, stereolithography (SLA) segment is expected to dominate the global military 4D printing market in 2040, in terms of growth rate.

On the basis of material, the others segment is anticipated to exhibit a remarkable growth during the forecast period.

On the basis of properties, the self-repair segment is expected to be the highest contributor to the military 4D printing market in terms of growth rate.

By application, the navy segment is anticipated to exhibit a remarkable growth during the forecast period.

By region, Asia-Pacific is anticipated to exhibit a remarkable growth during the forecast period.

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