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Model-based Enterprise - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Model-based Enterprise Market size is estimated at USD 20.76 billion in 2024, and is expected to reach USD 42.51 billion by 2029, growing at a CAGR of 15.42% during the forecast period (2024-2029).

The increasing adoption of 3D technology across multiple industry verticals to cater to the increasing demand for emerging applications, varying from shape analysis to 3D modeling, has given rise to developing and adopting model-based enterprise solutions that gauge product shapes in real-time. The technology offers many opportunities to design, produce, and perform novel architectural forms, construction systems, etc. It is an innovative, faster, and more agile product development and production method.

Diverse manufacturing industries are adopting digital technologies due to the rapidly growing capabilities of the software used, boosting market growth. With the introduction of CAD, 3D models have become the new industry standard for designing products, tooling, and manufacturing processes.

Industry 4.0 adopted digital technologies to enhance, automate, and modernize processes. Integrating different technologies, such as 3D technologies, is prevalent, as these technologies provide exceptional benefits, especially in the discrete manufacturing sector. The consumer product manufacturing industry is transforming from mass production to an industry indicated by mass customization. The process of how products are designed and delivered needs a new level of sophistication and metric that analyzes a complex set of data for deep insights.

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Industries are witnessing increased adoption of reverse engineering for its fast-rapid prototyping abilities and accuracy associated with producing new parts. Reverse engineering requires a strong, robust image acquisition system to acquire data accurately.

Deployment of 3D technology and solutions could enable manufacturers to achieve such objectives, boosting market growth. Most OEMs and many larger suppliers are now model-centric, where 3D models are created and used downstream. As the automotive industry transitions to the 3D environment, virtual product models offer them the opportunity to promote reuse, improve design efficiency, improve quality, and reduce cost across the enterprise.

Some challenges the market faces are a shortage of skilled workers, data security concerns, and the initial investment costs hindering business operations. Addressing these challenges is essential for companies to fully realize the benefits of model-based enterprise and stay competitive in today's digital manufacturing landscape.

The state of the world economy significantly shapes the demand for model-based enterprise (MBE) solutions across industries. Businesses' decisions to invest in digital transformation projects, including adopting MBE practices, are influenced by economic factors such as GDP growth, industrial production, and capital expenditure. Businesses are more inclined to devote money to innovation and efficiency improvement projects during economic expansion, which raises the need for MBE solutions.

For instance, according to a World Bank estimate, the North American GDP, which was USD 32.32 trillion in 2023, is predicted to increase by 1.5% in 2023-24, suggesting that corporate activity and possible model-based enterprise solutions investments are projected to flourish.

Model-Based Enterprise Market Trends

Automotive Sector to Witness Major Growth

The automotive industry is one of the first to promote the development of applications of model-based systems technology on a broad scale. The industry has produced some of the most advanced prototypes and products. According to the European Automobile

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Manufacturers' Association (ACEA), in June 2023, passenger car sales in the European Union increased Y-o-Y at a rate of 17.8%. Customers in the European market purchased around 1.27 million units in total, and all but one of the countries experienced positive growth.

In terms of the offering, the solutions segment is estimated to grow during the forecast period. With the introduction of computer-aided design (CAD), 3D models have become the industry standard for designing products, tooling, and manufacturing processes. Most OEMs and larger suppliers in the automotive industry are now model-centric, using 3D models, and are transitioning from 2D drawings as the master design authority.

3D virtual models allow automakers to improve design efficiency, reduce cost, and improve quality across the extended enterprise. The 3D design of the product, model-based definition (MBD), combined with the use of these models throughout the extended enterprise, or the model-based enterprise (MBE), is expected to transform the global automotive industry significantly.

There has been a rising adoption of MBE technology in the European automotive sector in recent years. In October 2023, Cheshire-based Autentica Car Parts introduced its platform that allows car designers and manufacturers to sell spare parts designs to dealers, distributors, and repair centers. The Autentica platform will help design owners and original equipment manufacturers (OEMs) sell spare parts produced locally using an on-demand 3D printing service. MBE aims to clarify design during the manufacturing process using the 3D model-based definition (MBD) that includes all the product and manufacturing information (PMI) related to the product's manufacturing.

North America Holds Largest Market Share

North America is anticipated to hold a significant share in the global model-based enterprise (MBE) market, owing to prominent players in the region, such as GE, PTC, Autodesk, and Aras. These companies are adopting strategies focusing on strengthening their market position. Institutes such as the Digital Manufacturing and Design Innovation Institute (DMDII) utilize their ability and expertise to transform the North American manufacturing sector by aiding organizations in the digital revolution.

The automotive end-user industry vertical in North America is witnessing a growing

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adoption of MBE solutions. The United States is one of the biggest automotive markets in the world. It is home to more than 13 major automotive manufacturers. Automotive manufacturing has been one of the largest revenue generators for the country.

The National Institute of Standards and Technology (NIST), an agency that promotes US innovation and industrial competitiveness, hosts the model-based enterprise summit to identify challenges in implementation during product and process design, manufacturing, quality assurance, and sustainment. In this context, digital models provide an authoritative source of information for various activities across a product's lifecycle.

NIST's MBE and QIF Summit will be held at the Chicago MxD facility in April 2024. Topics for the MBE Summit include product and manufacturing details from the MBE standards, users, and implementors' perspectives. QIF Summit is expected to include QIF 4.0 updates, training, certification initiatives, and Model-Based Characteristics (MBC 1.0).

The solution segment is anticipated to witness robust growth due to its growing adoption in smart city projects and Industry 4.0 initiatives. In the United States, Intel is collaborating with the city of San Jose, California, to implement Intel's IoT Smart City Demonstration Platform to further the Green Vision initiative. Using model-based enterprise solutions in these platforms is set to boost the market.

Canada is also taking significant steps toward implementing Industry 4.0 to increase manufacturing sales by 50% and export to USD 540 billion by 2030. This is analyzed to boost the regional manufacturing sector. Therefore, the penetration of model-based enterprises is expected to increase the market's growth rate.

Model-Based Enterprise Industry Overview

The model-based enterprise market is fragmented as various entities opt for long-term collaborations. Contracts are awarded to companies that can provide faster security updates, which has increased demand for model-based enterprise solutions. Some major players in the market are Siemens AG, General Electric Company, Dassault Syst?mes SE, SAP SE, and PTC Inc., among others.

In February 2024, Autodesk Inc. announced that the company had launched

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Autodesk Informed Design. This cloud-based solution connects design and manufacturing workflows to streamline the building design and construction process. It also allows architects to work with customizable, pre-defined building products that yield valid results and manufacturers to share their products with design stakeholders.

In February 2024, Aras announced that Johnson Matthey (JM) selected Aras Innovator to modernize its global PLM infrastructure and support its digital transformation strategy. Aras Innovator SaaS will be deployed as part of a multi-stage rollout beginning in the first quarter of 2024.

Additional Benefits:

The market estimate (ME) sheet in Excel format

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