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AI in Manufacturing Industryc

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ABSTRACT

AI or Artificial intelligence one of the most commonly used word in this era, an ability of a digital computer or computer administered robot to perform duty or chores. Ai enables computers to perform ultra modern functions including the ability to perceive, understand, interpret languages, analyze data and make suggestions. Ai is nowadays used in a vast variety of fields including finance, healthcare, Entertainment, manufacturing etc..

Ai has become the backbone of manufacturing industry, with its significant impact in manufacturing by revamping various aspects of the process, from automating tasks and forecasting failures to amplifying quality control and organizing supply chains. Ai helps in increased efficiency, coherence, cost saving and enhanced product quality.

Keywords: Ultramodern functionality, automating tasks, Organizing supply chain, enhanced productivity

Introduction

For last few decades manufacturing industry has been lacking energy due to inefficient manpower but thanks to latest enhancements in artificial intelligence, machine learning and manufacturing automation. With the help of Ai manufacturing today is very efficient, cost saving and ultramodern.

Ai is increasingly improving productivity levels and the market for Ai is expected to double over the next decade.

Personalized Manufacturing: Move over from mass production of collective products and make hyper-personalized products specific to customer needs with higher personalization and distinctive-identity.

Process Optimization: Roll over operational lags and malfunction with automated process flows that require minimal human interface. Improved use of sensors, programs & bots to make. processes efficient.

Prognostic Maintenance: Improve operational efficiency with minimal downtime and reduced maintenance costs. Build redundancies and manage schedules to improve cost-manufacturing ratio. Fig1 states the examples of ai in manufacturing.

Promote Machine Learning: Machine learning allows for faster decision making, actionable insights from Big Data and protects sensitive data to give your manufacturing the cutting-edge.

Procurement Automation: Procurement is often the hurdle for manufacturing to come unstuck. Automated procurement via predefined analytics & supply chain metrics can unclog this impediment.

Figure 1. Examples of Ai in manufacturing

Literature Review

On a Manufacturing level for business use, AI is a set of technologies that are based primarily on machine learning and deep learning, used for data analytics, predictions and forecasting, object categorization, natural language processing, recommendations, intelligent data retrieval, and more.

Top 10 Ai use in Manufacturing

- Supply Chain Management
- Cobots
- Warehouse Management
- Assembly Line Optimization
- New Product Development
- Performance Optimization
- Quality Assurance
- Streamlined Paperwork
- Demand Prediction
- Order Management

AI THE BACKBONE OF MANUFACTURING INDUSTRY

Facilitation in Big Data Analytics, have further backed artificial intelligence while automation systems have provided the stronghold for artificial intelligence to become more improvised, specific and output-oriented. The role of artificial intelligence as a tool in manufacturing industry today cannot be overemphasized. From improving productivity to redefining efficiency – artificial intelligence is setting new touchstones with each manufacturing day by day.

In manufacturing, Al-driven robots are used to work non-stop without taking breaks which reduces operating expenditure and optimizes production. Presently, industrial robots are increasingly being used as cobots (collaborative robots) which collaborate with humans to reduce their workload. Artificial Intelligence technology is made up of three domains Data, Computer Vision (CV) and Natural Language Processing (NLP).

Data: Data is the heart of Artificial Intelligence, as no Al system can be developed or functional without adequate data. For example, a biometric information system needs adequate data to identify each person on the basis of their unique fingerprint. The different types of data used in Al systems are Sound, Text, Image and Video.

Computer Vision (CV): The discipline of teaching machines how to see and perceive the human world is known as computer vision. This domain of Al enables machines to identify and process objects in

images and videos in the same way as humans do. Examples of this domain are, driver-less car, face recognition app, etc.

Natural Language Processing (NLP): This domain of Al is concerned with giving computers the ability to understand text and spoken words in much the same way as human beings do. Alexa is one such virtual assistant that can understand, process, learn from, and respond to voice inputs in natural ways.

As every coin has two sides so is ai it has its own advantages and disadvantages. Ai comes with many benefits, but unfortunately it has some drawbacks as well.

Artificial Intelligence has evolved with time and today takes a prominent place in the manufacturing industry.

Dominance of Ai

Minimizes Error: Humans can do error while doing tasks but the use of Al significantly reduces errors and increases accuracy and precision.

Zero Risk Tasks: Humans can overcome many risky tasks by letting Al robots do such tasks for them, whether it be defusing a bomb, going to space, or mining for coal and oil.

Non-stop Work: Humans can be productive for only about 6 to 8 hours in a day. They also need frequent breaks. But Al-driven machines can work endlessly without breaks and perform multiple tasks at a time with accurate results.

Unbiased Decisions: Human beings are driven by emotions and can be biased. Al, on the other hand, is devoid of any emotions and is highly practical in its approach. Such kind of unbiased approach ensures more accurate decision-making.

Limitations of Al

Less Creative: Al cannot work or think outside the box. It is capable of thinking with pre-fed data and past experiences. But unlike humans, it cannot be creative in its approach.

Promotes Unemployment: Al is slowly replacing humans with robots to do a number of repetitive tasks. The reduction in the need for human workforce has the potential of causing a great loss of many jobs.

Makes Humans Lazy: Al applications have made our life easier by automating many tasks. With the addiction of Al, we do not memorize things or do calculations and use our brains less and less.

Unexpressive: Machines cannot experience human emotions and moral values. They perform actions according to the pre-fed instructions and cannot make any difference between right and wrong.

Conclusion

Imagine an era where products and services are crafted specifically according to your need for you, catering and reaching to your unique needs and preferences.

AI is changing the manufacturing industry by significantly improving Quality, quantity, efficiency, productivity, and overall performance. Duly powerpacked with automation, predictive maintenance, and data-driven insights, AI helps manufacturers to increase productivity, optimize processes, reduce costs, and produce higher-quality goods. This mutiny in manufacturing is set to become even more pronounced as AI technologies continue to evolve and mature. A manufacturing process that embraces the power of customization to deliver exceptional user experiences.

Help of AI in manufacturing industry can be concluded with following.

- Cost Cutting
- Enhanced Quality and Quantity
- Predictive Maintenance
- Data-Driven Decision Making
- Improved coherence and productivity

The Future is Glittering

As AI technologies continue to evolve and become more accessible, they are self-assured to transform the manufacturing industry further.

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