

Implementation of Artificial Intelligence in Indian Industrial Sector

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Abstract-

AI (AI) is growing rapidly and there seems to be no change in coming years. In fact, coming years are going to be the years of AI, as many businesses and Industrial sectors are going to be making a shift to the AI-powered systems, apps, security systems, data analysis and lot more. In India, there's a huge scope for AI because the country has been a growing hub for business and ranks among the foremost lucrative investment destinations for technology transactions worldwide. In recent times, the country has focused its interest more on technology, realizing that it's an important component of economic development. From enterprises, agriculture, and education to healthcare and transportation, AI are often a transformative technology for the country.

Keyword: - robotics, industrial sector, automotive logistics, Manufacturing, artificial intelligent

Introduction:-

Application of AI in manufacturing sector in India is presently growing at a compound annual rate of growth of fifty .5%. The market of the manufacturing industry is predicted to be evaluated at \$1 billion in 2019. it's forecasted to get older to \$17 billion by 2025. These figures clearly show the definite need and an ultimate scope for any manufacturer with AI. Manufacturing companies in India are digitizing their plants with advanced process controls, analytics, and AI-based decision support solutions. Numerous Indian manufacturing companies are investing in AI AI-based factory automation solutions to enhance product quality and style, reduce labor costs, minimize manufacturing cycles, and monitor real-time condition of machines. to make sure efficiency and productivity, companies like Ansonia tabernaemontana Ltd., TVS Motor Company Ltd., JK Tyre & Industries Ltd., and Asian Paints Ltd. have deployed AI-based solutions and analytics platforms across their manufacturing units in India

Infrastructure need for deploying AI in Industrial Sector

1. Storage unit for AI:- one among the foremost important considerations is AI data storage, specifically the facility to scale storage because the quantity of data grows. As organizations prepare enterprise AI strategies and build the specified infrastructure, storage must be a top priority. that has ensuring the proper storage capacity, IOPS and reliability to affect the large data amounts required for effective AI. as an example, for advanced, high-value neural network ecosystems, traditional network-attached storage architectures might present scaling issues with I/O and latency. Similarly, a financial services company that

uses enterprise AI systems for real-time trading decisions may have fast all-flash storage technology.

Many companies are already building big data and analytics environments that leverage Hadoop and other frameworks designed to support enormous data volumes, and these will likely be suitable for several kinds of AI applications.

2. AI Networking infrastructure:- Networking is another key component of a AI infrastructure. to provide the high efficiency at scale required to support AI, organizations will likely got to upgrade their networks.

Deep learning algorithms are highly enthusiastic to communications, and enterprise networks will got to keep stride with demand as AI efforts expand. That's why scalability must be a high priority, which could require high-bandwidth, low-latency and artistic architectures.

Companies should automate wherever possible. for instance , they have to deploy automated infrastructure management tools in their data centers.

Network infrastructure providers, meanwhile, are looking to undertake to to the same . Software-defined networks are being combined with machine learning to make intent-based networks which may anticipate network demands or security threats and react in real-time.

3. Hardware: - Computational ability could also be a huge requirement of accelerating applications of AI within the core manufacturing sector. Infrastructure finds high computational load because of artificial neural networks, machine learning algorithms, and enormous data analytics tools. it's generating a true need for AI for powerfully impacting the manufacturing sector.

High-end computational units in global scale manufacturing industries are also trying to seek out IOT-based cohesive networks. They assist them generate continuous streams of data points, significant data routines, and analytics regime. There are critical requirements of AI integrated bots in production lines and holistic support around operations within the least times.

5. Software:- the primary and foremost requirement is to form optimization machine learning models that increase efficiency and overall profitability of a producing business. Machine learning models can excellent-tune target variables to scale back time material cost. It also increases power usage effectiveness (PUE), and critically shoot in-house resource utilization for maximized output.

The successful intrusion of AI within the manufacturing sector also underlines the necessity of analytics software and database integrated dynamic supply chain management (SCM) solutions, integrated enterprise resource planning (ERP) management and well-built CRM solutions. The trio of supply chain management solutions, CRM, and ERP are essential for capitalizing on a broad scope for AI Successful inclusion of artificially intelligent modules enables you with:

- * Interactive UX in complex ecosystems
- * Descriptive, predictive and prescriptive analytics
- * Advanced BI
- * Automated monitoring
- * Controlled operations.

Indian Industrial Sector using Artificial Intelligence for its Mass-production.

1. Automobile

The automobile sector features a genuine need for automation at ground level. Several automobile giants like Tata Motors, Hyundai, and Honda etc in India use AI along the side of blue-collar employees for efficient and faster production of auto parts.

With a bunch of robots and blue-collar employees, Hyundai plant in Sriperumbudur, Chennai, churns out one car every 30 seconds! Likewise, Tata motors, using industrial robotics and

automation for production, reveals a decrease in its production force by 20% and a rise in turnover by 250%.

Indian automation sector is presently undergoing a critical phase of recession where products worth INR 35,000 corer are currently being shelved trying to find buyers. Despite this, there are genuine use cases of AI in automotive. Machine learning, resulting in AI is that the torchbearer of all autonomous driving projects at the industry level. All major automobile manufacturers have pledged to eradicate fossil fuel-powered vehicles latest by 2030. there's also a trend of Internet-connected vehicles and internal communication vehicles. the car industry is additionally looking to return up with a mobility-as-a-service concept that needs AI for location-based data analytics. it's an answer to carpooling, vehicle sharing, and other greener practices as are necessary for the eco-friendly industry .

2. Power and energy

The power & energy sector can undergo an enormous transformation with AI-powered software that helps in intelligent energy management and storage. In-depth analysis of the production-consumption pattern is vital to make sophisticated software that bears renewable energy with AI-driven storage. Subsequent level application of AI enables building interim storage systems, and there is a scope of further optimization of these standalone systems depending upon the commercial or domestic use narrative.

AI can help cultivate conscious use of electricity. Companies can build customer profiles of power consumption and help them analyze the scope of energy consumption reduction. It'll help in reducing the overall energy requirement and also make energy-saving decisions supported the assembly forecast from ML models and production-consumption data.

3. Pharmaceutical: - The pharmaceutical industry is looking to combine the power of block chain-based comprehensive solutions with end-to-end AI capabilities. The target is to eliminate all possibilities of drug counterfeiting. Manufacturing industries also reportedly use AI for BI purposes and streamline their efforts for market acquisition. Visual & design intelligence is additionally helping in drug design and development supported the 3D arrangement of atoms and molecules through material science.AI (i.e. Robots) are proving advantageous in filling, inspecting, Packaging and manufacturing personalized medicines. Automation has now become an integral a part of the Pharmaceutical production process. the varied benefits of automation include: efficiency; saving workers from hazardous environments or repetitive tasks; reducing training overhead; eliminating human error; increasing repeatability and reproducibility; and reducing the potential for human contamination.

The pharmaceutical industry is marching past 2020 with gradually maturing solutions that

are capable of predicting medicinal capabilities impacting the high-level, commercial clinical trials. Moreover, people are looking to use artificial intelligent anesthesia systems for enhanced surgical robotics in close relation with the pharmaceutical industry. Interestingly, USFDA are often taken as a thought. It had granted special approval for commercial testing such systems.

4. Heavy metal and machinery manufacturing industry: -

Heavy metal and machinery manufacturing industry is looking to incorporate AI for procurement planning, efficient CNC operating modules in utilizable machinery designs supported specific requirements and constraints. Automation of the designing and manufacturing process with complete compliance with 100% scalability is vital for higher profitability.

5. Semiconductors & Electronics: - Semiconductor and industry is facing an acute shortage of skilled laborers, and AI is that the technology coming to the rescue. The necessity of skilled labor within the Chinese semiconductor electronics manufacturing industry is predicted to double from 2017 to 2025. The large-scale condition of highly precise electronic manufacturing lines is being created by artificially intelligent, utterly automated action lines.

The overall chip size of electronic components drastically reduces with time. Precise soldering and laser printing of microchips would require AI capabilities and optimization modules. This industry also needs computer vision very badly for improving the overall skills in control side.

6. Food & Beverages: - Continuously growing food tech start-ups are underlining the scope of AI-attention in food and average industry. The food and beverage industry is undoubtedly looking to eliminate the necessity of human labor and reduce the overall human intervention in models. Foodtech is additionally brewing AI-enabled suggestive platforms that perform reverse engineering through computer vision on images of food items and tell the necessity of ingredients and staple. It also suggests a recipe supported the availability of limited parts and staple.

7. Agriculture Sector:- Researches are underway for the establishment of the AI technology within the agricultural sector. From sowing seeds and watering plants to cutting weeds, spraying fertilizers, examining the soil and harvesting the yield, a robot can contribute massively in farming.

8. Banking Sector: - Moreover, processes like mortgage approval, mastercard processing, account cleansing and price accounting are often automated for the graceful running of bank processes. Humanoids, i.e., human-like robots, through their speech technology can inform customers of the merchandise categories and assist them in completing different bank processes.

9. Defense System: - Use of robotics within the Defense sector are often an enormous blow to the enemy countries of India. A report in Greater Kashmir has stated that the Defense Ministry is close to introduce robotic weapons to help the Indian Army to counterinsurgency and terror attacks. Robots within the army may lower the incidences of deaths or injuries among the soldiers, besides taking the place of soldiers when climate are adverse. After the Pulwama attack, such a measure becomes extremely important. The Centre for AI (CAIR) is within the process of developing Multi-Agent Robotics Framework (MARF), which might be utilized in scenarios like Pulwama Attack. Also, it's constructed the 'Robot Sentry'—a mobile robot which will perform patrolling and surveillance applications in extreme conditions—and the 'Snake Robot', which may help to navigate difficult passages.

Challenges in Adapting AI in Indian Industrial Sector

1. Lack of data about AI- many companies and enterprises struggled to alien there AI strategies to the business context due to lack of proper information and knowledge. Lack of in-depth knowledge and existing possible solutions is becoming a huddle for the successful mapping of used case.
2. Shortage of skilled personal and expertise- many companies are handling the shortage of skilled AI talents and difficulty in haring the specified roles
3. Implementation is expensive and lack of funds- many company deals with cost insensitive implementation of AI and lacks funds.
4. Issues in Data Management- many companies deals with data management issues in term of knowledge governance, acquisition, bias data.
5. Infrastructure limitation- For the successful adoption of AI in industrial sector, it essentially requires software, hardware, and technological infrastructure. If a producing business fails to successfully use anybody (or more) of those requirements, the corporate can expect unforeseen hurdles and deadlocks on its AI transformation journey.
6. Security-many wide spread use of AI system are raises variety of ethical, moral and legal issues that are yet to be addressed.
7. Not realizing the requirement- the event of a thinking AI system are currently too difficult to realize in practice. Many Company culture still not recognized the necessity of AI.

Future Scope of AI

Artificial Intelligence features many scope in India mainly because we've plenty of population. We'll already find many companies like Amazon and Google dominating by selling their products like Alexa and Google Home which may help the consumers automate some tasks by speaking.

Although, we don't have an entire of lot of physical devices in India which may be automated since India is far behind the newer technologies that are getting used within the earth . But during a few of years I'm sure India will have many individuals making use of AI during a way or the opposite.

Once the govt. . provides education to the agricultural areas of India, it'll bring out tons

more people within the market that are becoming to be eligible to use such technology. Since they're literate, this allows them to be ready to use AI for his or her own tasks. Most of which can be done through phones, since this class of individuals won't have the support to shop for for a Alexa, per say

As of now we'll only have AI in India within the backend services. Not as a frontier like Alexa, because it are becoming to be too early for the Indian public to know and make use of it. With the strong promotions done by this BJP government towards Digital India, we see that the number of individuals using smart phones have quite doubled in these past few years and thus the rise of Jio has performed as a catalyst bringing out free internet to the people of India, thus making a commendable push towards a more Digital and Smarter India.

METHODOLOGY

The following seven steps outline a simple and effective strategy which I had use for finding information for my research paper and documenting the sources which I had found.

Depending on my topic:-

Step 1: Identify and Develop my Topic

Step 2: Find Background Information

Step 4: Use Databases to Find Journal Articles

Step 5: Find Internet Resources

Step 6: Evaluate What my Find

Step 7: Cite What my Find Using a Standard Format

Conclusion

Artificial intelligence, a futuristic technology, and thus the manufacturing sector are bound to be impacted. Use of artificial intelligence-based practices during a corporation is becoming a replacement dimension of competition, but it's imperative to research the prospects beforehand. It's always advisable to think the AI adoption journey throughout; right from a thought on paper to the results which you're presumably to understand with the conservative approach.

It is always advisable to travel for a financial consultancy before kick-starting any transformational adoptions of technology within the Company or Organization. AI is closely related to higher productivity and profitability for a corporation , and it's going to impact the competition, criticality, and overall manufacturing space within the top of the day.

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