# **ROLE OF ARTIFICAL INTELLIGENCE IN OPERATION/ PRODUCTION MANAGEMENT**

**Introduction**

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Using **Artificial Intelligence in operations management** approaches is the key to maximizing the value and efficiency of business processes.

Cost concerns are mounting as industry competition heats up. Heavy industries with longer gestation periods and long-term ROI, such as chemical, power, and thermal, suffer from internal and external influences that move quickly.

As a better option than moving manufacturing operations to less expensive regions, robotics and automation have come to the rescue. Additionally, made-to-order is the new standard in manufacturing, which itself is changing. Less inventory is needed, and a more real-time operating environment are requirements of just-in-time, lean manufacturing. So how should businesses adapt to and embrace this changing environment? The solution is to develop better and smarter using Artificial Intelligence.

Artificial Intelligence and Machine Learning teach computers to carry out tasks in a semi-supervised manner utilizing enormous data sets. **AI in operations management** is used in the full life cycle of manufacturing, from problem detection to problem communication to problem resolution, is covered by this.

**Evolution Of Artificial Intelligence in Operations Management**

“Artificial intelligence (AI) is a broad term and can refer to various technologies. John McCarthy first put forth this idea in 1950, during the famed Turing Test. Since the Dartmouth workshop in 1956, this field has been around for a very long time. But initially, there wasn’t much interest in it. Since the early 2000s, artificial intelligence (AI) has advanced quickly, attracted new attention, and has been given another look in both research and practical applications in past years. AI combines science and engineering to create intelligent devices. As a result, the goals of AI can be categorized as both engineering and scientific goals”.

**Examples of Artificial Intelligence in operations management** include but are not limited to robotics, self-driving cars, automated financial investments, etc. **Artificial Intelligence(AI) in operations management** has demonstrated its utility in meeting the following requirements.

**Process Automation in the Workplace**

The market in the commercial sector has changed due to the alluring nature of digitization. Manual processes that rely on paperwork reduce businesses’ manufacturing efforts, and companies should structure their internal processes excellently.

The term “Robotic Process Automation” usually refers to a software-based approach to controlling corporate processes, including routine operations, systematized data, and determining outcomes. Although robotics in production is not new, their capabilities and functions have substantially improved, often outpacing human talents.

**Data Analytics for Gaining Insights**

The operational, strategic, and tactical decision-making processes heavily depend on information. However, the calculation and data collection within businesses is increasing swiftly. In its simplest form, Big Data analytics is the application of the most recent statistics to any kind of electronic communication, including “messages, updates, photographs posted to social networks, readings from sensors, and GPS signals from the cell phone.” Big data analytics makes it possible to improve how much data is processed.

**Reasonable Client Engagement**

Businesses are developing personal customer relationships due to rapid technological improvements, and brands are gradually working to do the same through digital channels. Many communication techniques are expanding across many channels, including blogging, publishing brand-related films on social media, and consumer feedback. Social media platforms serve as a medium for disseminating information about the products in both business-to-business and business-to-consumer organizations as a result of technological advancement and digitization.

**Smart Agents**

Online group purchasing is popular with consumers. Intelligent agents based on cutting-edge algorithms can haggle to reduce the effort required to gather information about the buyer, the cost of the transaction, and the sellers’ bargaining. When buyers and sellers negotiate, smart agents can assist models other than C2B.

**Advice Regarding Goods and Services**

The development of **AI in operations management**has led to an evolution in product and service recommendation systems for businesses to boost engagement, personalization, and sales by leveraging simple visuals and verbal cues.

As Artificial Intelligence develops quickly, new ideas and priorities are emerging to improve sales management.

**Employee Participation**

There are two ways **Artificial Intelligence in operations management** is used to enhance staff management. First, companies may easily access vast data about their business operations to achieve an efficient decision-making process. Second, enterprises can handle and interpret the data in real-time thanks to Artificial Intelligence’s ongoing development.

**Employee Benefits**

AI can affect how physically and emotionally engaged employees are. Employee benefits directly impact and may enhance organizational excellence. For instance, in the modern age, AI-supported online survey tools can assist in identifying employees’ demands concerning their company.

**Personnel Resource Techniques**

The human resource information system is crucial to the decision-making process for efficient human resource management in this technological age. A knowledge discovery database combined with an intelligent decision support system (IDSS) can enable a semi-structured and unstructured process of HR decisions.

**Analysis of Safety and Quality**

Governments and the auto industry are primarily concerned with safety and quality. Validating inductive learning using inputs from the contemporary environment and achieving the high levels of dependability required for full fleet formation are the key technical challenges. Making an end-to-end construction and formation technique that incorporates safety issues and endless technological specialties into a combined strategy may also be a substantial challenge.

**Excellence in Operations**

Operational excellence is a notion that emphasizes leadership abilities and problem-solving methods as the primary components of ongoing development. Businesses need to learn how to proceed with operational excellence since it is difficult to describe, and most companies regard it as too broad or questionable. Employee and manager attitudes go beyond the activities that businesses carry out.

**Advantages of Artificial Intelligence AI in Operations Management**

Here are significant benefits that AI has for businesses, along with some instances from particular sectors:

**AI automates repetitive learning and discovery through data.** Instead of automating manual tasks, AI performs frequent, high-volume, computerized tasks. And it does so reliably and without fatigue. Of course, humans are still essential to set up the system and ask the right questions.

**AI adds intelligence** to existing products. Many products you already use will be improved with AI capabilities, much like Siri was added as a feature to a new generation of Apple products. Automation, conversational platforms, bots and smart machines can be combined with large amounts of data to improve many technologies. Upgrades at home and in the workplace, range from security intelligence and smart cams to investment analysis.

**AI adapts through progressive learning algorithms** to let the data do the programming. AI finds structure and regularities in data so that algorithms can acquire skills. Just as an algorithm can teach itself to play chess, it can teach itself what product to recommend next online. And the models adapt when given new data.

**AI analyzes more and deeper data**using neural networks that have many hidden layers. Building a fraud detection system with five hidden layers used to be impossible. All that has changed with incredible computer power and [big data](https://www.sas.com/en_in/insights/big-data/what-is-big-data.html). You need lots of data to train deep learning models because they learn directly from the data.

**AI achieves incredible accuracy** through deep neural networks. For example, your interactions with Alexa and Google are all based on deep learning. And these products keep getting more accurate the more you use them. In the medical field, AI techniques from deep learning and object recognition can now be used to pinpoint cancer on medical images with improved accuracy.

**AI gets the most out of data.**When algorithms are self-learning, the data itself is an asset. The answers are in the data. You just have to apply AI to find them. Since the role of the data is now more important than ever, it can create a competitive advantage. If you have the best data in a competitive industry, even if everyone is applying similar techniques, the best data will win.

**Increase in Productivity and Efficiency** Gains in productivity and efficiency are two of the benefits of AI integration in enterprises that are commonly discussed. Tasks are completed by technology faster and on a larger scale than by humans.

AI, on the other hand, frees up human workers to concentrate on higher-value occupations by taking over those responsibilities from them. This enables businesses to maximize their human capital skills while minimizing the costs associated with performing routine, repeatable tasks that technology can handle.

**Enhanced Responsiveness and All-round Visibility** Your company can collect pertinent historical and present data from numerous linked devices thanks to Artificial Intelligence(AI) in operations management through the supply chain. This involves integrating business intelligence tools with current data as well as CRM, SRM, and ERP systems. In this manner, a more thorough evaluation of the performance is possible. Similar to risk prediction, risk minimization is a goal of supply chain data analysis for distribution networks.

**Increased Business Speed** AI enables quicker development cycles and a shorter time between conception and commercialization, which leads to a larger and more rapid return on investment for development expenditures.

**Improved Fleet Effectiveness** In supply chain management, timely product delivery is paramount. Cutting-edge AI-based GPS technologies improve navigation and route optimization for transportation and transit. These systems use Machine Learning to process the driver, vehicle, and customer data to determine the best path for product delivery. They simultaneously assist you in saving time and money for upcoming shipments.

**Edge Over Competitors** Keeping an eye on market trends and patterns is the secret to remaining competitive in the supply chain industry. Real-time data from outside sources, such as industrial production, weather, and employment history, can be accessed by AI in supply chain analytics. With all the gathered information, you can more accurately assess the state of the market and anticipate future requirements for steady growth.

You can modify your product portfolio and capital expenditure by utilizing the AI’s sensory capabilities. Currently, this is supply chain management’s preferred use of Artificial Intelligence.

**Inventory Management Became Easier** Remember that the supply chain industry needs to be built on effective inventory management. Machine vision software with analytics can reduce the usual manual input and produce precise forecasts. The AI systems interpret the real-time machine data that continuously tracks the inventory and stock in the warehouses.

**Future Insight Access** The supply chain business has access to the highest level of agility thanks to the AI ecosystem. The same is true with the application of data science to supply chain forecasting, which enables you to anticipate your client’s needs. This is comparable to moving your supply chain business into the future to maximize client happiness.

The advantages listed above serve only to highlight how AI and analytics are being used more and more in supply chains and logistics. Once you investigate the applications of these technologies in your company, investing in AI-based supply chain analytics solutions will become easier.

**Improved Surveillance** Organizations may use near-instantaneous monitoring capabilities that have the ability to alert them to issues, recommend actions, and in some situations, even initiate a response thanks to AI’s power to take in and interpret enormous volumes of data in real-time.

For instance, using data collected by devices on factory equipment, AI can spot issues with those machines and forecast when maintenance will be required. This prevents expensive and disruptive breakdowns and the cost of performing maintenance because it is scheduled rather than because it is clearly necessary.

AI’s monitoring capabilities can be equally successful in other contexts, such as enterprise cybersecurity operations where vast amounts of data need to be evaluated and interpreted.

**Conclusion**

AI is how companies will operate in the future, revolutionizing how operations are managed. AI-powered systems are evidence that technology is revolutionizing operations management and advancing companies’ productivity and efficiency.

The contact between the company and its customers is crucial to corporate operations. AI also improves this aspect of corporate processes. As this technology works to give contextual information, much like the company’s workforce, robotic process automation is altering the game.