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Implementation of IoT, Reshaping the retail industry and e-commerce-An Overview

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ABSTRACT: Innovations are shaping our lives. Today, It is evident that a plethora of advancements surround us and simplify our lives. Hard work has essentially been supplanted by smart work. IoT stands for Internet of Things, one such amazing innovation. IoT as we know, is the billion physical devices around the world that are now connected to the internet, all collecting and sharing data. The way that consumers make purchases is evolving due to the Internet of Things. By 2025, the retail IoT industry is projected to be valued \$94.44 billion. With the help of e-commerce, growing household income, technological developments, and higher expectations, the Indian retail industry is changing quickly. Since the internet's introduction, the retail industry has undergone radical transformations.. New innovative technologies are being used by the retailers to provide seamless and unique shopping experience to the customer. One technology giving retailers a competitive edge is the internet of things, and smart retailing is currently popular to meet rising consumer expectations. This study tries to comprehend the idea and elucidate applications of the internet of things in retailing. It also covers the topic of IoT as a potential benefit for retailers, IoT technology providers, and barriers to IoT adoption, particularly in the retail industry.

I. INTRODUCTION

The advent of internet give rise to technological advance world and Internet of things is the new buzz terminology which is used for machine-to-machine connectivity. The internet of things is shaping almost all business sectors and retailing is one of them making retailing smarter beyond our imagination. Internet of things is a combination of artificial intelligence and machine learning making the collected data useful for the marketers. One best example of IoT is at your home fridge reminding you about milk requirement and controlling your air conditioner while sitting at office. Internet of things will prove disruptive to the retail industry (Gregory, 2015). Internet of things has a strong impact on retailing and retailers are now focusing on providing better in store shopping experience for the customers making it much more unique, efficient, and of course profitable as IoT offers the ability to interact with both devices and people which further provides information on brand performance, present and potential customers, customer engagement, introducing new product, store layout optimization.

How IoT is Revolutionizing Retail and e-Commerce?

Businesses are increasingly using IoT to increase revenue, reduce costs, improve efficiency, and provide a better experience for their customers. IoT has transformed these two sectors, including logistics, warehousing, and supply chain management, as well as the end customer. The existence of IoT has made many things easier and better .It has aided in decision-making, data collection and analysis, workflow automation, and more.. With changing lifestyles and an ever-evolving business environment, IoT adoption is of great importance.



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Internet of Things Applications in eCommerce and Retail

1. Automate Shopping Processes

Automated checkouts like Amazon Go are becoming a reality thanks to the Internet of Things. Shoppers can enter the store, make their purchases, and leave the store, and their purchases are automatically paid for using their smartphones. Additionally, predictive technology allows you to predict when customers will be ready to shop. The store collects the items they receive. All you have to do is deposit the items you want to purchase into the machine and pick them up at your driveway.



2. Inventory Management

IoT sensors and radio frequency identification (RFID) tags have completely changed the way inventory is organized. These sensors and tags can learn all important information without human intervention, including: B. Product Type, Availability, and Expiration Date. This helps, as:

- Customers can use it to check product availability.
- It helps entrepreneurs to monitor both the quantity and quality of their products.
- Sensors, for example, check whether the storage temperature of perishable food is low enough and notify the system if it is not.

3. Management of The Supply Chain:

During supply chain management, IoT devices enable accurate and detailed tracking of the movement of items. IoT sensors and RFID tags help companies track what is happening to their products, including their location, speed, and



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weather conditions. We will notify you of the exact arrival time to prevent loss or misdelivery. Customers benefit from gadgets as they can track where their products are and when they will arrive at their doorstep. You can also automate the shipping and delivery process to prevent lost items. Helps monitor features such as vehicle speed and temperature.

4. Internet Of Things Enabled Robots:

For example, Amazon uses IoT-enabled robots to manage picking, packing, and other tasks to ensure product effectiveness. Amazon also uses drones to pick up and deliver goods. Autonomous mobile robots optimize warehouse operations by reducing labor costs and increasing the speed and accuracy of order processing without disrupting ongoing warehouse operations.

5. Warranty and Maintenance

IoT technology helps to remotely evaluate products and items, predict maintenance, and analyze performance. They provide businesses with detailed information about how their products are used and the ability to predict and prevent malfunctions. If the sensor node tells the company that the product isn't working properly, they can call the customer and let them know and offer to repair or replace the device before a problem occurs. IoT can help provide notifications that alert users if an item is lost or stolen.

6. Personalization

E-commerce makes the most relevant information about your customers available, which improves the customized experience you can provide to your customers, increasing customer loyalty and sales for your company. In situations like this, data collected by smart home devices can be very useful. For example, if a refrigerator uses too much energy, a company can lure that person with an advertisement for an environmentally friendly model, promising cost and energy savings. Smartphones are another useful tool for businesses to collect accurate information about their customers. Insurance companies are using his IoT-enabled smart devices, such as GPS and speed sensors, to track discounts for careful drivers and rate hikes for drivers who frequently speed.

7. Customer Experience

IoT allows e-commerce companies to easily stand out from their competitors. IoT is being used by a variety of companies to gain insights into a number of products that are becoming increasingly popular on social media. This technology allows retailers to offer customers a more complete shopping experience with a higher degree of personalization, increasing customer satisfaction and loyalty. IoT helps e-commerce companies focus on specific customer groups by allowing them to customize advertising and marketing. Search trends and web browsing can be used to accurately identify different purchasing patterns, making it easier for businesses to sell customized products to diverse customers.

Benefits of IoT in Retail

The retail industry is seeing an increase in IoT adoption for a number of reasons. Technology helps with process optimisation, employee productivity increases, consumer behaviour analysis, and the creation of new business models. Let's examine the main advantages of using IoT apps in retail settings.





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• Supply Chain Management at Its Best:

Using RFID and GPS technologies, retailers are able to scan and check every item in warehouses, while it's in transportation, and when it's on the shelves. Real-time data is consistently streamed from the floor to the store via connected sensors. It facilitates route optimisation, expedites product delivery, helps locate any bottlenecks, and allows for contingency planning. It also makes it possible for distributors, suppliers, and manufacturers to expedite vendor and customer deliveries while optimising shipping and handling times.

• Improved Client Relationship:

Accurate evaluation of customer data by machine learning algorithms and IoT capabilities allows for the personalisation of shopping experiences. Shopping can be made more personalised with the use of Bluetooth Light Energy (BLE) beacons, which notify and alert shoppers via smartphone about special discounts and seasonal deals based on the vicinity of their location.

Layout Optimization: IoT technology can enhance the in-store layout by combining infrared sensors and aisle analytics software. It aids in maximising consumer behaviour. With the use of this data, one may comprehend the buyer journey, spot impatient and perplexed customers, and ascertain the causes of abandoned carts. In order to improve client retention rates and anticipate demand, supply, and ratios of return, staff members can benefit from predictive analytics in the retail industry and machine learning-based demand forecasting.

Efficient Inventory Management: Assets and inventories can be easily synchronised with data centres via RFID chips, beacons, and sensors. In the warehouse and on the front shelves, smart price tags and digital displays with built-in image analytics capabilities help to better control and arrange stock levels and expiration dates.

II. CONCLUSION

Since its inception, the Internet of Things has played a key role in revolutionizing the way businesses, governments, and people interact, among others. With the increasing use of sensors, actuators, and microchips, there is no doubt that the impact of IoT will increase significantly in the coming years and permeate the entire e-commerce industry. As more devices connect to the internet and incorporate smart components, more data is generated and the potential for improved consumer experiences increases. IoT will become the key to modern retail as more devices become connected within the ecosystem. There is potential for significant sales increases and improved inventory management practices.

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