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# A Study on Smart Warehousing Using IOT and Robotics in Amazon Warehouse in Coimbatore

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**Abstract:** Smart warehousing integrates Internet of Things (IoT), robotics, automation, and advanced data analytics to improve warehouse efficiency and accuracy. With the rapid growth of e-commerce and global trade, traditional warehouse systems are being replaced with technology-driven operations. This study examines the role of IoT and robotics in smart warehousing, analyzes key benefits and challenges, and evaluates technological improvements in warehouse management.

**Keywords:** Smart Warehousing, Internet of Things (IoT), Robotics, Automation, Warehouse Management System (WMS), Inventory Control, Supply Chain Management.

## I. INTRODUCTION

Smart warehousing is a modern warehouse management approach that uses IoT devices, robotics, artificial intelligence, and cloud computing to automate warehouse operations. These technologies help in real-time inventory tracking, faster order processing, and reduced operational errors. With increasing customer demand for faster delivery, smart warehouses play a crucial role in supply chain efficiency.

## II. OBJECTIVES OF THE STUDY

- 1) To understand the concept of smart warehousing.
- 2) To analyze the role of IoT and robotics in warehouse operations.
- 3) To examine technological recommendations for improving warehouse efficiency.
- 4) To evaluate benefits and challenges of automation.

## III. RESEARCH METHODOLOGY

The study is based on secondary data collected from research articles, web resources, and the reference material provided. A descriptive research design is adopted to analyze technological implementation and its impact on warehouse performance.

## IV. TECHNOLOGIES USED IN SMART WAREHOUSING

- 1) Internet of Things (IoT): Enables real-time tracking using RFID, sensors, and GPS.
- 2) Robotics: Autonomous Mobile Robots (AMRs) assist in picking, sorting, and transporting goods.
- 3) Warehouse Management System (WMS): Integrates data for inventory and shipment control.
- 4) Artificial Intelligence: Supports demand forecasting and predictive analytics.

## V. DATA ANALYSIS

Table 1: Technology Preference for Improving Warehouse Efficiency

Technology	Number of Respondents	Percentage
IoT Tracking Systems	40	26.7%
Autonomous Robots	35	23.3%
Smart Delivery Drones	25	16.7%
AI-Based Inventory System	30	20.0%
Electric Handling Equipment	20	13.3%

- Interpretation: The table shows that 26.7% of respondents prefer IoT tracking systems to improve warehouse efficiency, followed by 23.3% preferring autonomous robots. AI-based inventory systems account for 20%, while smart delivery drones and electric handling equipment are preferred by 16.7% and 13.3% respectively. This indicates that real-time tracking and automation are the most preferred technologies for smart warehousing improvement.

Table 2: Level of satisfaction with smart warehouse technologies

Satisfaction level	Number of respondents	Percentages (%)
Highly satisfied	28	56%
Satisfied	15	30%
Neutral	5	10%
Dissatisfied	2	4%
Total	50	100%

- Interpretation: The table shows that 56% of respondents are highly satisfied with smart warehouse technologies, while 30% are satisfied. Only 4% expressed dissatisfaction. This indicates that the majority of respondents have a positive perception of IoT and robotics implementation in warehouse operations.

Table 3: Impact of smart warehousing on operational efficiency

Level of improvement	Number of respondents	Percentages (%)
Very high improvement	22	44%
High improvement	18	36%
Moderate improvement	7	14%
Low improvement	3	6%
Total	50	100%

- Interpretation: The above table reveals that 44% of respondents believe smart warehousing has brought very high improvement in operational efficiency, while 36% report high improvement. Only 6% perceive low improvement. This shows that smart technologies significantly enhance warehouse performance.

## VI. FINDINGS

- 1) IoT tracking systems are the most preferred technology.
- 2) Robotics significantly improves order accuracy and speed.
- 3) Automation reduces operational cost in the long term.
- 4) Technology adoption increases warehouse productivity.

## VII. SUGGESTIONS

- 1) Implement IoT-based inventory systems for real-time visibility.
- 2) Adopt robotics gradually to reduce financial burden.
- 3) Provide employee training for handling smart technologies.
- 4) Strengthen cybersecurity measures in automated systems.

## VIII. CONCLUSION

The study concludes that smart warehousing using IoT and robotics enhances operational efficiency, accuracy, and customer satisfaction. Though initial investment is high, long-term benefits such as cost reduction, faster processing, and better inventory control make it a vital strategy for modern supply chain management.



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