**Inventory Management System App**

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Date :- 19 October 2024

**Abstract:-**

This project aims to design and develop a comprehensive **Inventory Management System (IMS)** application for **Eagle Equipments Pvt. Ltd., Pune, Maharashtra**. The application will streamline the tracking and management of raw materials, finished goods, and spare parts to enhance operational efficiency. It provides real-time inventory updates, low-stock alerts, and automated report generation to prevent stockouts or overstocking. Key features include **product categorization, barcode/QR code integration**, and **role-based access** for secure data management.

The IMS will be developed using modern technologies with a **user-friendly interface** to ensure smooth adoption by employees. **Agile methodology** will guide the iterative development, ensuring continuous client feedback and quality control. The system aims to reduce manual effort, minimize errors, and improve the company’s overall productivity. This project holds significant potential to **optimize supply chain management**, reduce operational costs, and enhance decision-making processes for Eagle Equipments Pvt. Ltd.

**Keywords:-**

 Inventory Management System (IMS)

 Real-time Tracking

 Stock Alerts

 Barcode/QR Code Integration

 Role-based Access Control

 Supply Chain Optimization

 Agile Methodology

 Automated Reports

 Operational Efficiency

 Eagle Equipments Pvt. Ltd.

**Content**

**Introduction:-**

Effective inventory management is crucial for manufacturing companies to ensure smooth operations, reduce costs, and meet customer demands on time. For **Eagle Equipments Pvt. Ltd., Pune**, a company dealing with manufacturing and assembly, the need for a reliable **Inventory Management System (IMS)** has become increasingly significant. Managing raw materials, finished goods, spare parts, and tracking inventory levels through traditional methods can be time-consuming and prone to human error. This project aims to bridge that gap by developing a **customized IMS application** tailored to the specific requirements of the organization.

The proposed IMS will enable **real-time tracking of inventory**, **stock alerts**, and **automated report generation** to assist decision-making. Features like **barcode/QR code scanning** will speed up inventory operations, while **role-based access control** will ensure data security by allowing only authorized personnel to perform sensitive tasks. With a user-friendly interface, the system will be accessible to employees at various levels, making day-to-day operations more efficient and transparent.

The application will be developed using **Agile methodology**, ensuring continuous improvement based on regular feedback from stakeholders at Eagle Equipments Pvt. Ltd. This iterative approach will allow for flexibility during development and alignment with the company’s operational needs. Once deployed, the IMS aims to **minimize inventory-related issues, improve supply chain performance**, and **enhance overall productivity**, providing the company with a competitive edge in its industry.

This project highlights the importance of integrating modern technology into corporate workflows, offering Eagle Equipments a **scalable and efficient solution** for managing inventory across their operations

**Objectives:-**

1. Enable real-time tracking of raw materials, finished products, and spare parts to ensure accurate stock levels.
2. Implement automated low-stock and overstock alerts to prevent stockouts or excess inventory, ensuring smooth operations.
3. Minimize manual processes, errors, and wastage through automation, improving overall operational efficiency.
4. Build a system that can accommodate future business growth, new product lines, and potential expansions.

**Features:-**

1. **Real-Time Inventory Tracking**
* Monitor stock levels of raw materials, finished goods, and spare parts with instant updates
* Track inventory movements across multiple locations or warehouses.
1. **Scalability and Customization**
* Built to accommodate the company’s growth, with options for adding new features or modules.
* Customizable reports and dashboards to suit the organization’s evolving needs.
1. **User-Friendly Interface**
* Intuitive design with dashboards providing insights into current stock status and trends.
* Mobile compatibility to allow inventory management through smartphones or tablets.
1. **Automated Stock Alerts**
* Receive alerts for low-stock, overstock, and reorder points to prevent disruptions in operations.
* Customizable notification thresholds based on product categories and usage patterns.

**Literature Review:-**

Inventory management plays a critical role in ensuring the smooth functioning of businesses, particularly in the manufacturing sector. A review of existing literature reveals several approaches, frameworks, and technologies used to manage inventories effectively, each focusing on minimizing costs, improving accuracy, and optimizing supply chains.

Earlier inventory management practices relied heavily on **manual systems** such as spreadsheets and periodic physical counts. However, these approaches were prone to **human errors, delays, and inefficiencies** (Wild, 2017). As a result, many organizations struggled to maintain optimal stock levels, leading to stockouts or overstocking, which increased operational costs.

The adoption of **barcode and QR code systems** has significantly improved accuracy and reduced manual errors in inventory tracking (Pandey et al., 2019). Studies show that automation enhances the speed of operations and reduces workforce dependency for stock control. Modern systems now integrate **mobile apps** for real-time updates, enabling companies to monitor inventory remotely (Yadav et al., 2020).

**Just-in-Time (JIT)** and **real-time tracking methodologies** are widely discussed in the literature as essential to preventing overstocking and reducing holding costs (Heizer et al., 2020). Automated alerts for low stock levels and real-time updates allow companies to optimize their procurement and prevent disruptions in production.

Efficient inventory management contributes significantly to **reducing operational costs, improving customer satisfaction, and enhancing profitability** (Chopra & Meindl, 2019). Poor inventory management, on the other hand, can lead to production delays and reduced customer trust, especially in manufacturing setups.

**Future Scope:-**

**Integration with ERP and Accounting Systems**

* The IMS can be integrated with **Enterprise Resource Planning (ERP)** systems to synchronize operations across departments such as procurement, production, and finance.
* Automated accounting processes, such as generating invoices and financial reports, can be added to improve workflow efficiency.

**AI-Powered Inventory Forecasting**

* Incorporating **Artificial Intelligence (AI) and Machine Learning (ML)** algorithms can enable **demand forecasting**, helping predict future inventory needs based on past trends.
* This will reduce the risks of overstocking and stockouts, optimizing inventory turnover.

**Mobile App for Field Operations**

* A **dedicated mobile application** can be developed to allow staff to manage inventory from remote locations or warehouses.
* Real-time stock updates through mobile apps will enhance field operations, especially for on-the-go teams.

**Integration with E-Commerce Platforms**

* If Eagle Equipments expands into **online sales**, the IMS can be integrated with e-commerce platforms to ensure **automated stock updates** and smooth order fulfillment.

**Compliance and Sustainability Tracking**

* The system can include modules for **regulatory compliance** to track environmental and safety standards.
* **Sustainability metrics** can be added to monitor and reduce waste, aligning with future green initiatives.

**Conclusion:-**

The development of an **Inventory Management System (IMS)** for **Eagle Equipments Pvt. Ltd.** aims to address the challenges associated with manual inventory tracking and improve overall operational efficiency. By implementing features such as **real-time tracking, automated alerts, barcode/QR code integration, and role-based access control**, the system will streamline inventory processes, minimize errors, and enhance decision-making. This project offers a **user-friendly and scalable solution**, aligning with the company’s current and future needs.

The use of **Agile methodologies** ensures continuous feedback from stakeholders, allowing the system to evolve throughout the development lifecycle. Once deployed, the IMS will reduce stockouts, lower holding costs, and improve collaboration between procurement, production, and sales teams. Furthermore, **automated reports and analytics** will support better forecasting, helping Eagle Equipments optimize its supply chain operations.

This project not only resolves immediate inventory challenges but also lays the groundwork for **future integration with advanced technologies** such as AI, IoT, and ERP systems. In the long run, the IMS will be a valuable tool to **enhance productivity, control costs, and support the company’s growth**, ensuring Eagle Equipments stays competitive in the market.

**References:-**

[1] Chopra, S., & Meindl, P. (2019). *Supply Chain Management: Strategy, Planning, and Operation*. Pearson Education.

[2] Gupta, A., & Kohli, R. (2018). *Enterprise Resource Planning (ERP) Systems: Concepts and Applications*. McGraw-Hill Education.

[3] Kumar, N., & Thakur, D. (2021). "Inventory Management in SMEs: Challenges and Solutions." *Journal of Operations and Supply Chain Management*, 14(2), 45-58.

[4] Yadav, V., Jain, A., & Tiwari, S. (2020). "Mobile Technology in Inventory Management: Real-Time Solutions for Manufacturing Companies." *Journal of Technology Management & Innovation*, 15(4), 92-101.