# SYNOPSIS

# ON

**"AI- Powered Dynamic Ration Distribution System for Rural and Urban Areas"**

# BACHELOR OF COMPUTER APPLICATIONS
of
# University of Mysore



By
Karthik H A: U01CO22S0287
Gagan D S: U01CO22S0288
Divya N: U01CO22S0289
Nidhi A: U01CO22S0290

## Under the Guidance of:
**Ms Manaseswarey**
Assistant Professor, Dept of BCA
Mysore



DEPARTMENT OF BACHELOR OF COMPUTER APPLICATIONS
BGS FIRST GRADE COLLEGE
MYSURU-23

2023-2024

## Aim

The aim of this project is to leverage Artificial Intelligence to create a smart, efficient, and equitable ration distribution system. By utilizing predictive analytics and real-time tracking, the system will ensure that ration supplies are delivered to the right places based on demand, geographic location, and consumption patterns, ensuring minimal waste and maximizing resource efficiency. This system seeks to modernize ration distribution for both rural and urban populations while promoting fairness, transparency, and sustainability.

## Introduction

The public distribution system (PDS) for ration supplies plays a crucial role in providing essential goods like food grains, sugar, and kerosene to marginalized sections of society. However, the existing ration distribution systems are often prone to inefficiencies, mismanagement, and lack of timely data. These issues are exacerbated by unpredictable demand in both rural and urban settings. This project aims to introduce an AI-powered system to solve these challenges by automating the distribution process, predicting demand trends, and optimizing resource allocation. By incorporating AI, the system can adapt to changing circumstances, improve accuracy, and minimize fraud or errors in delivery, thereby enhancing the overall experience for end-users.

## Existing System

The existing ration distribution system in rural and urban areas faces several challenges that hinder its efficiency and effectiveness. The current system largely relies on manual operations and traditional data management methods, which often lead to errors, data loss, and inefficiencies. Without predictive mechanisms, the system struggles with demand forecasting, resulting in either stock shortages or surplus rations, causing wastage and unmet demand during critical periods. Inventory management is inefficient, with manual tracking leading to delays in replenishment and inaccuracies in stock status.

Additionally, the lack of real-time monitoring makes it difficult to oversee distribution activities and address discrepancies promptly.

## Disadvantages

- **Manual Distribution Process:** Current systems depend heavily on manual processes, which leads to errors, inefficiencies, and delays in ration distribution.

- **Lack of Predictive Analysis:** The existing systems don't have the capability to predict demand, resulting in both surplus and shortages of supplies.

- **Limited Transparency:** There is often a lack of transparency and accountability in the distribution process, leading to corruption, diversion of goods, and delayed deliveries.

- **Inadequate Resource Allocation:** The existing systems struggle to efficiently allocate resources based on varying demands, leading to uneven distribution between rural and urban areas.

- **Poor Route Management:** Distribution routes are not optimized, leading to longer delivery times and higher transportation costs.

## Proposed System

The AI-Powered Dynamic Ration Distribution System will address the limitations of the current system by introducing automated demand forecasting, real-time tracking, and optimization algorithms. Using machine learning models, the system will continuously learn from past distribution patterns to predict future demands and adjust ration supplies accordingly. The system will also track real-time inventory levels at various distribution centers and optimize delivery routes, ensuring timely and cost-effective delivery.

## Advantages

1. **Improved Efficiency:** Automated demand prediction, real-time tracking, and optimized distribution routes reduce human errors and improve overall efficiency.

2. **Reduced Wastage:** Predictive algorithms will help ensure the right amount of supplies are sent to the right locations, reducing over-supply and waste.

3. **Equitable Distribution:** The AI algorithms consider the specific needs of rural and urban communities, ensuring that resources are distributed fairly.

4. **Increased Transparency:** The system will allow authorities to track the delivery process in real-time, ensuring that ration distribution is transparent and accountable.

5. **Cost Optimization:** By optimizing delivery routes and reducing unnecessary transportation, the system will lower costs for both the government and distribution agencies.

6. **Fraud Detection:** AI models will identify discrepancies in ration distribution, minimizing the risk of fraud and corruption.

## Modules Used

1. **Demand Prediction Module:**

o Uses machine learning to analyze historical data and predict future ration requirements based on population, weather, economic conditions, etc.

2. **Inventory Management Module:**

o Tracks the current stock of ration supplies at various distribution points and alerts authorities when reordering is needed.

3. **User Interface (UI) Module:**

o A dashboard for government authorities and distribution agencies to monitor supply levels, track deliveries, and assess system performance.

4. **Recipient Verification Module:**

o Ensures the recipients of rations are verified based on biometric data, preventing misuse and ensuring that only eligible individuals receive the supplies.

5. **Reporting and Analytics Module:**

o  Provides detailed reports on the performance of the distribution system, including supply levels, delivery efficiency, and fraud detection insights.

## Hardware and Software Requirements

### Hardware requirements:

The hardware is required for an actual running of the system. The minimum hardware required is as follows,

| | |
|---|---|
| Processor | Intel Core i3 and above |
| RAM | Minimum 8 GB |
| Storage | 256 GB SSD |

### Software Requirements:

Software forms the heart of any system. It is responsible for driving the hardware. The software required is as follows,

| | |
|---|---|
| Operating system | Windows 10/11 (64-bit) or macOS/Linux. |
| Language used | HTML,CSS, Javascript, Bootstrap |
| Back end tool | C# |

| Platform | VS Code |
| --- | --- |
| | Database:MsSQL |

## Conclusion

The AI-Powered Dynamic Ration Distribution System promises to revolutionize the way ration supplies are managed and distributed in rural and urban areas. By leveraging artificial intelligence for demand prediction, inventory management, and route optimization, this system can increase the efficiency, fairness, and transparency of ration distribution. This will not only improve the lives of people in need but also streamline operations for authorities, reduce waste, and combat issues like fraud and mismanagement in public distribution systems. Ultimately, this project aims to create a more equitable and responsive supply chain that benefits society as a whole.