Problem Statement:

Factories and retailers often have items nearing expiration that go to waste, while event organizers frequently need bulk items on short notice. Connecting these two groups can reduce waste, save costs, and promote sustainability.

Challenges to Be Addressed

1. **User Registration and Profiles**:

- **Factory/Retailer Profile**: Includes information about the company, location, types of items available, and typical quantities.
- **Event Organizer Profile**: Includes details about the organization, types of events they organize, and item requirements.

2. **Inventory Management**:

- Factories/Retailers can list items nearing expiration, including quantities, expiration dates, and location.
- Event organizers can search for items based on their needs and event dates.

3. **Matching Algorithm**:

- The app uses an algorithm to match available items with event organizers based on factors like proximity, type of item, and required quantities.

4. **Notifications and Alerts**:

- Alerts for event organizers when items matching their needs become available.
- Notifications for factories/retailers when an event organizer shows interest in their items.

5. **Logistics and Delivery Coordination**:

- Options for coordinating pickup and delivery between the supplier and the event organizer.
- Integration with third-party delivery services for convenience.

6. **Payment and Transactions**:

- Secure payment gateway for transactions.
- Options for discounted or donation-based transfers.

7. **Reviews and Ratings**:

- Both parties can rate and review each other to build trust and credibility.

8. **Analytics and Reporting**:

- Track items saved from waste.
- Reports on environmental impact and savings.

Survey on This Topic

A review of existing literature and current industry practices reveals several key insights:

- **Current Practices**: Traditional inventory management systems often lead to waste and are not optimized for connecting suppliers with short-term bulk buyers.

- **Innovative Solutions**: Some regions have begun experimenting with platforms that connect suppliers with buyers in need of short-term bulk items, showing promising results.

- **AI Integration**: AI technologies are increasingly being applied to optimize matching algorithms and logistics coordination but are less commonly used for comprehensive waste reduction strategies.

- **Case Studies**: Successful examples include platforms that connect restaurants with surplus food to charities and apps that alert users to discounted items nearing expiration.

- **Challenges Documented**: Technical and economic barriers, such as the cost of implementing smart systems and the need for real-time optimization, are frequently cited.

Methodology (Technology Used)

- **User Registration and Profiles**:
    - **IoT Sensors**: Devices to monitor inventory levels and expiration dates.
    - **AI Algorithms**: Predictive models to match items with event organizers based on various factors.
- **Inventory Management**:
    - **Real-Time Sensors**: Devices to detect and monitor inventory levels and conditions.
    - **Mobile Applications**: Platforms for suppliers to list items and for organizers to search for needed supplies.
- **Matching Algorithm**:
    - **Smart Matching Systems**: Algorithms to match available items with event organizers based on proximity, item type, and quantity needed.
    - **AI Predictive Maintenance**: Tools to optimize logistics and prevent delays.
- **Notifications and Alerts**:
    - **Smart Alert Systems**: Real-time alerts for matching items with needs.
    - **Data Analytics**: Tools to optimize alert systems based on historical data.
- **Logistics and Delivery Coordination**:
    - **Smart Logistics Systems**: Coordination platforms for pickup and delivery.
    - **Integration with Delivery Services**: APIs to connect with third-party logistics providers.
- **Payment and Transactions**:
    - **Secure Payment Gateways**: Systems for handling transactions securely.
    - **Donation-Based Transfers**: Options for transferring items without cost for charitable purposes.
- **Reviews and Ratings**:
    - **Rating Systems**: Platforms for rating and reviewing suppliers and organizers.
    - **Community Feedback**: Tools for collecting and analyzing user feedback.
- **Analytics and Reporting**:
    - **Data Analytics**: Tools for tracking items saved from waste.
    - **Environmental Impact Reports**: Systems for reporting on environmental benefits and cost savings.

Expected Outcomes

1. **Energy Efficiency Improvements**:
    - Reduction in energy consumption through optimized logistics.
    - Decreased reliance on traditional inventory disposal methods.
2. **Environmental Benefits**:
    - Lower carbon footprint due to reduced waste.
    - Promotion of sustainable practices and resource optimization.
3. **Economic Advantages**:
    - Cost savings for suppliers and event organizers.
    - Reduced operational costs for inventory management and logistics.
4. **Technological Advancements**:
    - Development and deployment of advanced inventory management systems.
    - Innovations in IoT, AI, and data analytics for waste reduction.
5. **Scalability and Replicability**:
    - Proven models and methodologies that can be replicated across different regions and sectors