SILVER OAK UNIVERSITY
EDUCATION TO INNOVATION

COLLEGE OF TECHNOLOGY

ADITYA SILVER OAK INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

A Report on

Food Entrepreneurship
Surplus milk and Dairy Waste

DIGITAL TRANSFORMATION OF WORKFORCE MANAGEMENT FOR ORGANIZATIONAL EFFICIENCY

Under Subject of

PROBLEM BASED LEARNING - II

Semester - VI

Submitted by

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HOD Name
Prof. Jay Dave

Aditya silver oak institute of technology

Department of Computer Engineering

CERTIFICATE

This is to certify that the project entitled "**Food Entrepreneurship**" has been carried out by **"Ansh Butani", "Gautami Koradiya", "Trush Isamaliya"** under my guidance in fulfillment of the Problem Based Learning-II (1010003392) Subject of Bachelor of Engineering in **Computer Engineering** – 6th Semester of Silver Oak University, Ahmedabad during the academic year 2024- 2025.

Faculty Name	**HOD Name**
Prof. Dhenu Patel	Prof. Jay Dave

ACKNOWLEDGEMENT

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We would like to extend my gratitude to **Prof. Jay Dave** head of Computer Engineering Department, Silver Oak college of Engineering and Technology, Ahmedabad, for his continuous encouragement and motivation.

Last but not the least we would like to mention here that we are greatly indebted to each and everybody who has been associated with our project at any stage but whose name does not find a place in this acknowledgement.

Yours Sincerely

Gautami Koradiya
Butani Ansh
Trush Isamaliya

ABSTRACT

The Surplus Milk Management System is a strategic digital and operational framework aimed at addressing the issue of excess milk production in dairy supply chains. The project focuses on the timely identification, collection, and transformation of surplus milk into high-value, long shelf-life dairy products such as milk powder, cheese, butter, and UHT milk. This system integrates digital tracking, inventory monitoring, and processing workflows to minimize wastage, enhance profitability, and ensure sustainability.

By utilizing technologies such as cloud computing, IoT sensors, and data analytics, the system provides real-time insights into milk production trends and surplus levels. The solution also promotes efficient logistics coordination, better demand forecasting, and streamlined conversion processes. The ultimate goal is to stabilize market prices, reduce environmental impact, and create economic opportunities by adding value to surplus milk through product diversification.

LIST OF FIGURES

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1. INTRODUCTION

- ## Project Summary

  The Surplus Milk Management System is designed to tackle the seasonal and regional oversupply of milk by enabling its conversion into durable dairy products. Through timely data collection, intelligent routing, and product processing, it aims to prevent spoilage and economic loss. The system supports real-time monitoring of surplus levels, integrates with local dairy plants, and enables strategic product diversification, ultimately strengthening food security and rural incomes.

- ## Purpose

  To provide a sustainable, technology-driven solution for managing excess milk by converting it into value-added, shelf-stable dairy products. This reduces wastage, supports dairy farmers, and promotes circular agricultural practices.

- ## Scope

  - Track surplus milk production across farms and dairy centers.
  - Enable automated alerts for excess milk detection.
  - Connect with processing units for product conversion (e.g., milk powder, ghee, cheese).
  - Support cold-chain and storage management.

- ## Technical and Literature Review

  Technical Overview:

  - **Frontend: ReactJS / Android Mobile App**
  - **Backend: Node.js / Laravel**
  - **Database: MySQL / Firebase**
  - **IoT: Milk volume and quality sensors**
  - **Cloud Storage: AWS / Google Cloud**

  Literature Review Highlights:

  - Studies (2020–2024) from FAO and NDDB show that over 10% of milk produced goes to waste due to lack of cold storage and market linkage.
  - Converting surplus to dairy products reduces spoilage and increases farmer income by up to 25%.
  - Countries like New Zealand and the Netherlands successfully implement surplus milk drying and export strategies

2. SYSTEM REQUIREMENT STUDY

User Characteristics

- **Farmers:** Need simple interfaces to report milk volumes.
- **Dairy Cooperatives:** Monitor intake and coordinate transport to plants.
- **Processing Plants:** Receive alerts and production instructions.
- **Administrators:** Oversee system-wide logistics and analytics.

Hardware Requirements

- IoT milk sensors
- Mobile/tablet for field entries
- Servers with cloud backup
- Milk processing machinery (dryers, fermenters, packaging units)

Software Requirements

- **Frontend:** ReactJS / Flutter • **Backend:** Laravel / Node.js
- **Database:** MySQL or MongoDB.
- **Security:** SSL/TLS, role-based access

3. SYSTEM ANALYSIS

Study of Current System:

- Manual tracking of milk production leads to uncoordinated supply.
- Lack of real-time updates causes delays in processing surplus milk.
- Limited options to preserve or transport excess milk efficiently.

Problems in Existing Systems:

- Spoilage during peak production times.
- Income loss for farmers due to non-collection • Wastage due to underutilized dairy capacity.

Requirement of New System:

- Real-time surplus alerts from dairy collection points.
- Automated scheduling for milk diversion to processing units.
- Historical data to plan for conversion into long shelf-life products.

Non-Functional Requirements:

- High availability
- Secure and scalable cloud system
- Mobile and desktop access
- Integration with logistics and storage platforms

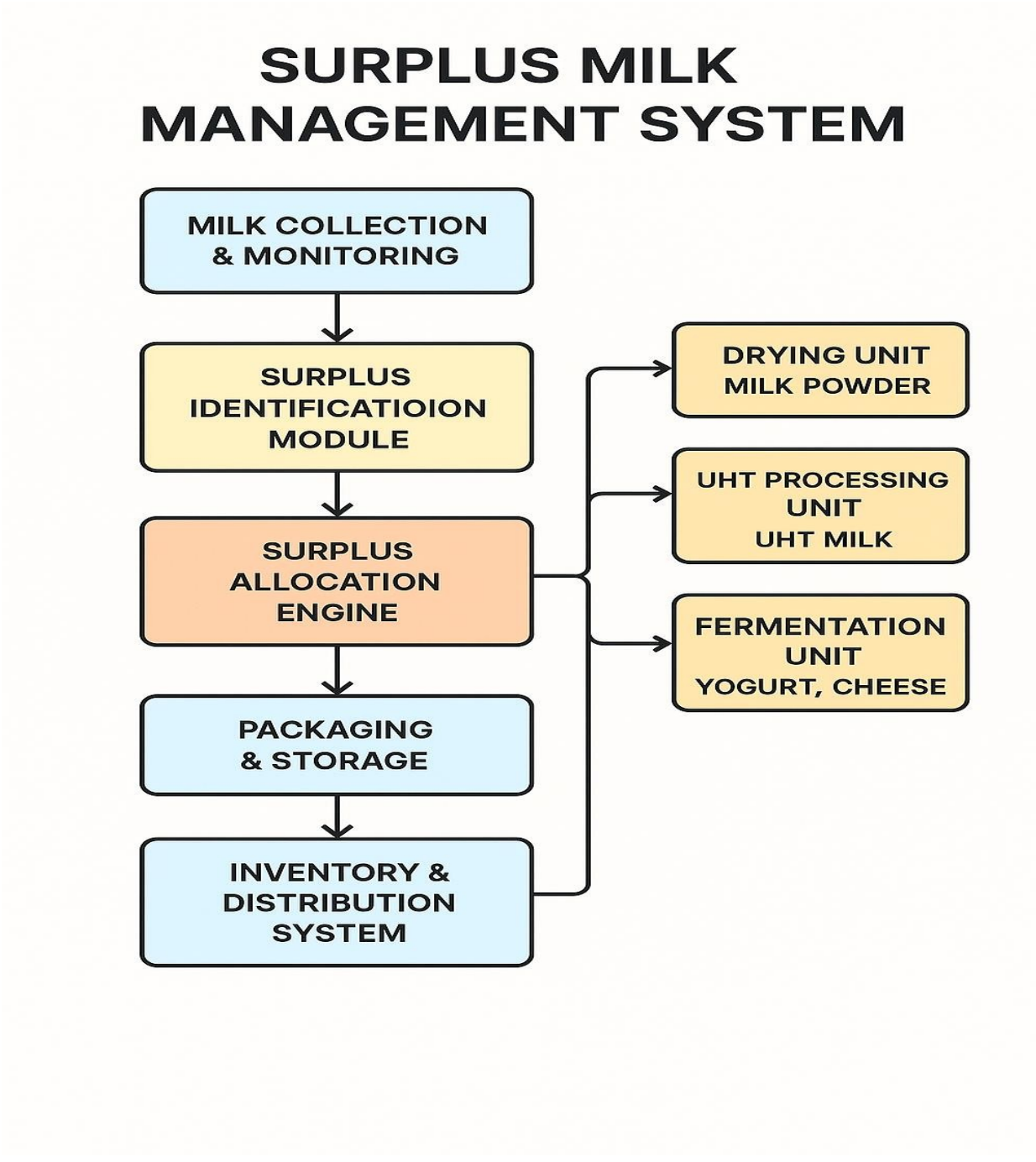
Functional Requirement:

- Surplus Detection Module
- Transport & Processing Coordination
- Product Conversion Tracker
- Reporting & Forecasting Tools

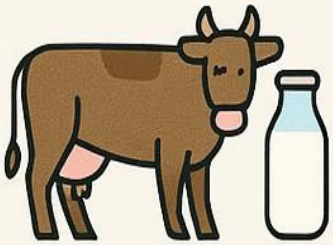
Feasibility Study:

- **Operational:** Ease of adoption with farmer cooperatives and local dairy units.
- **Technical:** Supported by IoT and existing dairy tech infrastructure.
- **Economic:** Savings from reduced spoilage, new income via product sales.

4. SYSTEM DESIGN


SURPLUS MILK MANAGEMENT SYSTEM
MILK COLLECTION & MONITORING
SURPLUS IDENTIFICATIOION MODULE
SURPLUS ALLOCATION ENGINE
PACKAGING & STORAGE
INVENTORY & DISTRIBUTION SYSTEM
DRYING UNIT MILK POWDER
UHT PROCESSING UNIT UHT MILK
FERMENTATION UNIT YOGURT, CHEESE

SURPLUS MILK LIFECYCLE

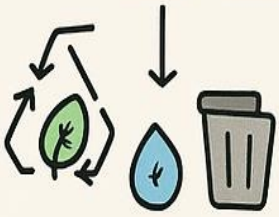


MILK PRODUCTION
Dairy farms produce milk: not all is consumed or sold

PROCESSING INTO VALUE-ADDED PRODUCTS
Cheese, yogurt, butter, milk jowder

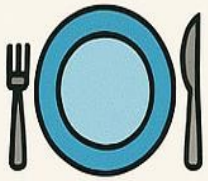
Decision Point: Use, Process, or Dispose?

PROCESSING INTO VALUE-ADDDODUCTS
Cheese, yogurt, butter, milk powder



RECYCLING/ BLOGAS DISPOSAL

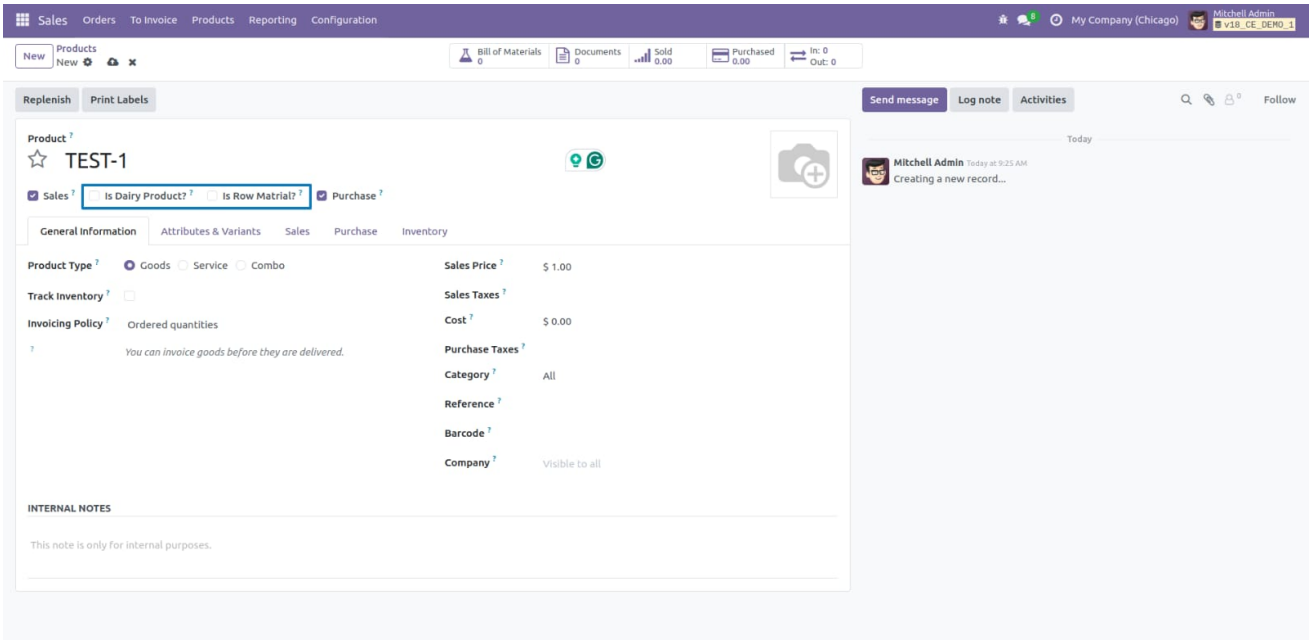
CONSUMPTION

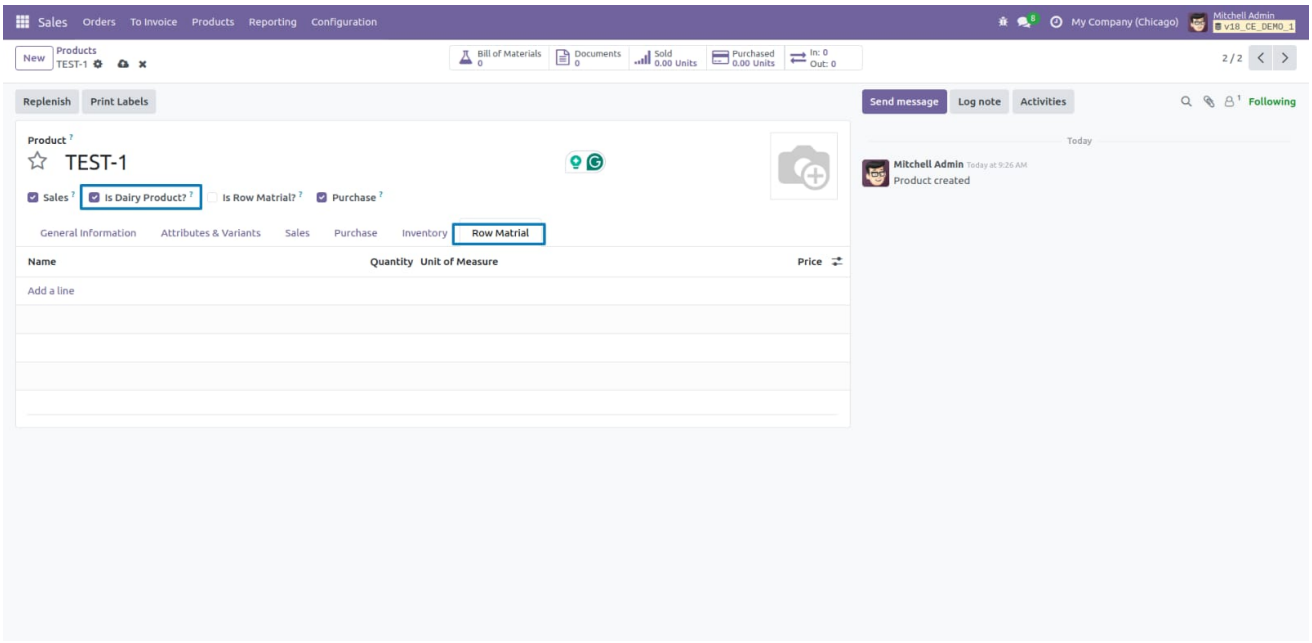


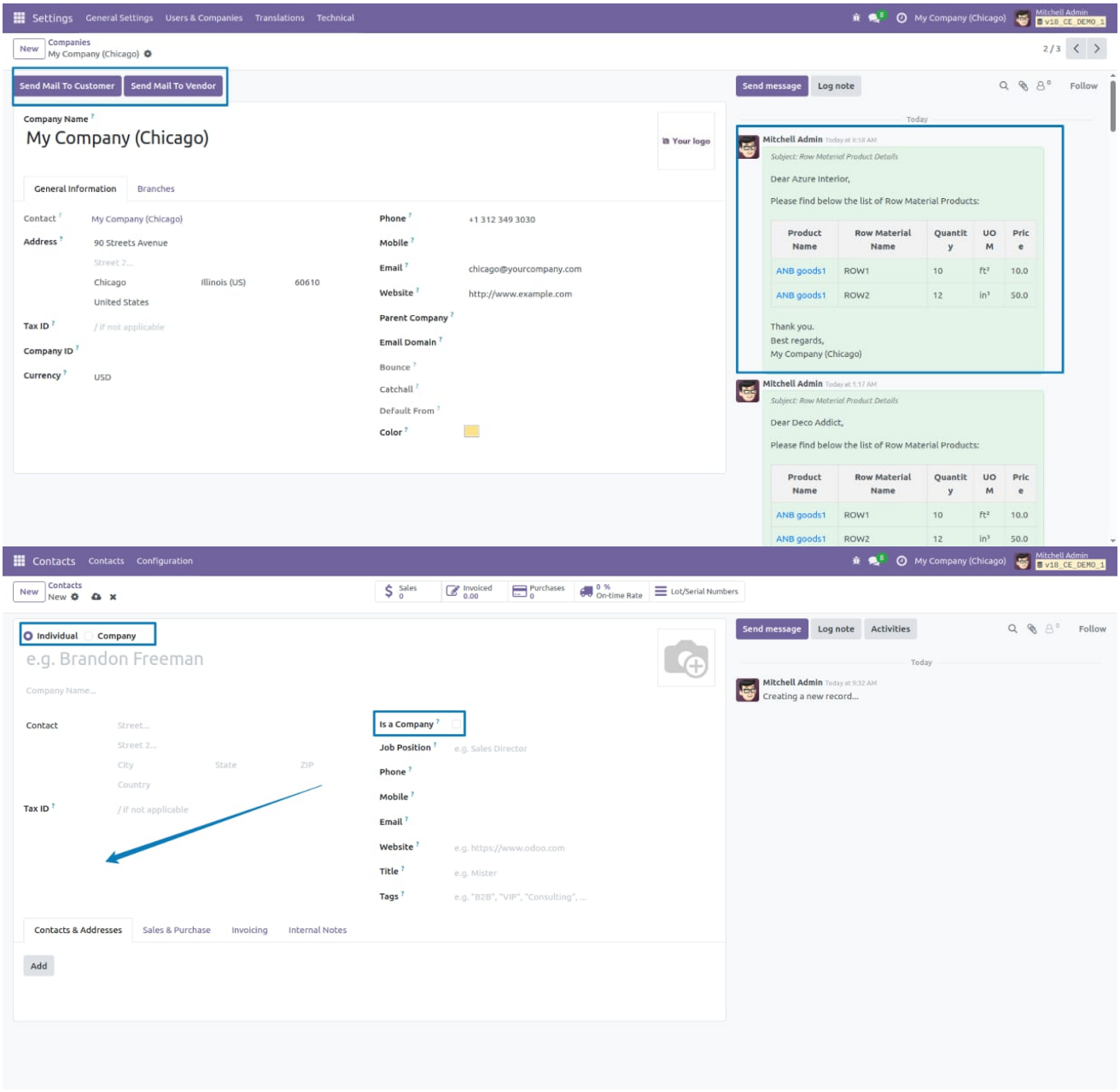
Unused surplus is:
- Converted to energy (anserobic digestion)
- Composted
- Safely discarded

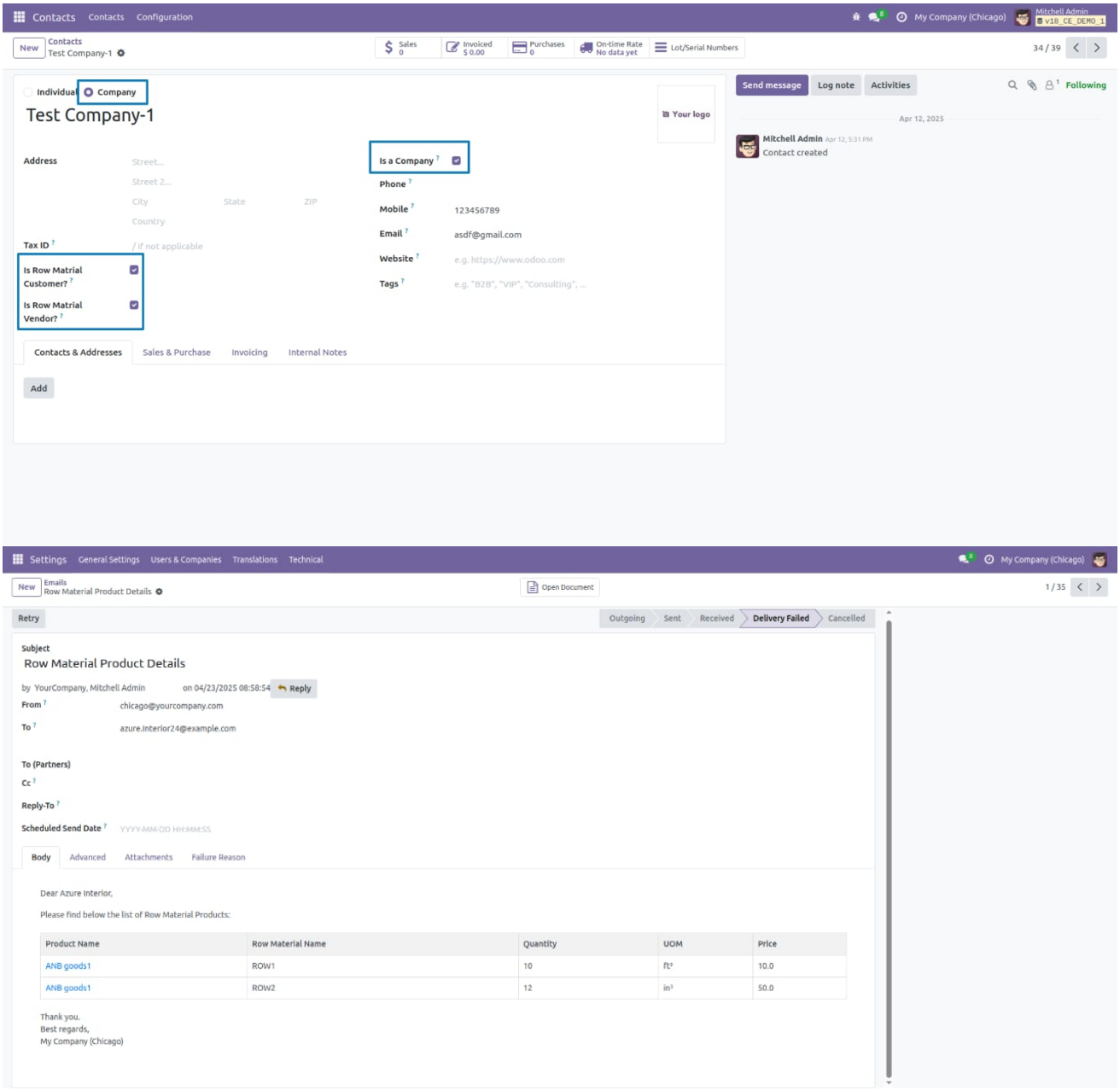
STOCKPILING/ REDISTRIBUTIOLN
Sent to food barlks or reserves

ANIMAL FEED / FERTILIZER
Redirected to farrms, composting


Sales
Orders
To Invoice
Products
Reporting
Configuration
My Company (Chicago)
Mitchell Admin
V18_CE_DEMO_1
New
Products
New
Bill of Materials 0
Documents 0
Sold 0.00
Purchased 0.00
In: 0
Out: 0
Replenish
Print Labels
Send message
Log note
Activities
Follow
Product
TEST-1
Sales
Is Dairy Product?
Is Row Matrial?
Purchase
General Information
Attributes & Variants
Sales
Purchase
Inventory
Product Type
Goods
Service
Combo
Track Inventory
Invoicing Policy
Ordered quantities
You can invoice goods before they are delivered.
Sales Price
$ 1.00
Sales Taxes
Cost
$ 0.00
Purchase Taxes
Category
All
Reference
Barcode
Company
Visible to all
INTERNAL NOTES
This note is only for internal purposes.
Today
Mitchell Admin
Today at 9:25 AM
Creating a new record...


Sales
Orders
To Invoice
Products
Reporting
Configuration
My Company (Chicago)
Mitchell Admin
V18_CE_DEMO_1
New
Products
TEST-1
Bill of Materials 0
Documents 0
Sold 0.00 Units
Purchased 0.00 Units
In: 0
Out: 0
2 / 2
Replenish
Print Labels
Send message
Log note
Activities
Following
Product
TEST-1
Sales
Is Dairy Product?
Is Row Matrial?
Purchase
General Information
Attributes & Variants
Sales
Purchase
Inventory
Row Matrial
Name
Quantity
Unit of Measure
Price
Add a line
Today
Mitchell Admin
Today at 9:26 AM
Product created


Settings
General Settings
Users & Companies
Translations
Technical
My Company (Chicago)
Mitchell Admin
v18_CE_DEMO_1
New
Companies
My Company (Chicago)
2 / 3
Send Mail To Customer
Send Mail To Vendor
Send message
Log note
Follow
Company Name
My Company (Chicago)
Your logo
General Information
Branches
Contact
My Company (Chicago)
Address
90 Streets Avenue
Street 2...
Chicago
Illinois (US)
60610
United States
Tax ID
/ if not applicable
Company ID
Currency
USD
Phone
+1 312 349 3030
Mobile
Email
chicago@yourcompany.com
Website
http://www.example.com
Parent Company
Email Domain
Bounce
Catchall
Default From
Color
Today
Mitchell Admin
Today at 8:58 AM
Subject: Row Material Product Details
Dear Azure Interior,
Please find below the list of Row Material Products:
Product Name
Row Material Name
Quantity
UOM
Price
ANB goods1
ROW1
10
ft²
10.0
ANB goods1
ROW2
12
in³
50.0
Thank you.
Best regards,
My Company (Chicago)
Mitchell Admin
Today at 1:17 AM
Subject: Row Material Product Details
Dear Deco Addict,
Please find below the list of Row Material Products:
Product Name
Row Material Name
Quantity
UOM
Price
ANB goods1
ROW1
10
ft²
10.0
ANB goods1
ROW2
12
in³
50.0
Contacts
Contacts
Configuration
My Company (Chicago)
Mitchell Admin
v18_CE_DEMO_1
New
Contacts
New
Sales
0
Invoiced
0.00
Purchases
0
0 %
On-time Rate
Lot/Serial Numbers
Individual
Company
e.g. Brandon Freeman
Company Name...
Contact
Street...
Street 2...
City
State
ZIP
Country
Tax ID
/ if not applicable
Is a Company
Job Position
e.g. Sales Director
Phone
Mobile
Email
Website
e.g. https://www.odoo.com
Title
e.g. Mister
Tags
e.g. "B2B", "VIP", "Consulting", ...
Contacts & Addresses
Sales & Purchase
Invoicing
Internal Notes
Add
Send message
Log note
Activities
Follow
Today
Mitchell Admin
Today at 9:32 AM
Creating a new record...


Contacts
Contacts
Configuration
My Company (Chicago)
Mitchell Admin
V18_CE_DEMO_1
New
Contacts
Test Company-1
Sales
0
Invoiced
$ 0.00
Purchases
0
On-time Rate
No data yet
Lot/Serial Numbers
34 / 39
Individual
Company
Test Company-1
Your logo
Address
Street...
Street 2...
City
State
ZIP
Country
Tax ID
/ If not applicable
Is Row Matrial Customer?
Is Row Matrial Vendor?
Is a Company
Phone
Mobile
123456789
Email
asdf@gmail.com
Website
e.g. https://www.odoo.com
Tags
e.g. "B2B", "VIP", "Consulting", ...
Contacts & Addresses
Sales & Purchase
Invoicing
Internal Notes
Add
Send message
Log note
Activities
Following
Apr 12, 2025
Mitchell Admin Apr 12, 5:31 PM
Contact created
Settings
General Settings
Users & Companies
Translations
Technical
My Company (Chicago)
New
Emails
Row Material Product Details
Open Document
1 / 35
Retry
Outgoing
Sent
Received
Delivery Failed
Cancelled
Subject
Row Material Product Details
by YourCompany, Mitchell Admin
on 04/23/2025 08:58:54
Reply
From
chicago@yourcompany.com
To
azure.interior24@example.com
To (Partners)
Cc
Reply-To
Scheduled Send Date
YYYY-MM-DD HH:MM:SS
Body
Advanced
Attachments
Failure Reason
Dear Azure Interior,
Please find below the list of Row Material Products:
Product Name
Row Material Name
Quantity
UOM
Price
ANB goods1
ROW1
10
ft²
10.0
ANB goods1
ROW2
12
in³
50.0
Thank you,
Best regards,
My Company (Chicago)

5. LIMITATION AND FUTURE ENHANCEMENT

Limitations:

- Dependence on internet connectivity for rural areas.
- Initial investment in IoT devices and processing units.
- Need for consistent training for cooperative staff.

Future Enhancements:

- AI-based demand and surplus prediction
- Integration with cold chain logistics
- Blockchain for traceability in dairy products
- Expansion to include waste-to-energy options for spoiled milk
- Voice Command Integration
- Export support features for powdered milk and cheese

6. TIMELINE CHART

7. CONCLUSION

The Surplus Milk Management System offers a practical and scalable solution to a recurring problem in dairy farming. By enabling the conversion of excess milk into long shelf-life dairy products, the system not only reduces wastage but also improves profitability for producers and processors alike. Its adoption will lead to enhanced food security, reduced environmental impact, and a more resilient dairy supply chain.

8. REFERENCE

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