White Paper - Livestock & Dairy Plant Management

FCR Control

Smart Inventory Management

Monitoring & Reporting

Selection Made Easy
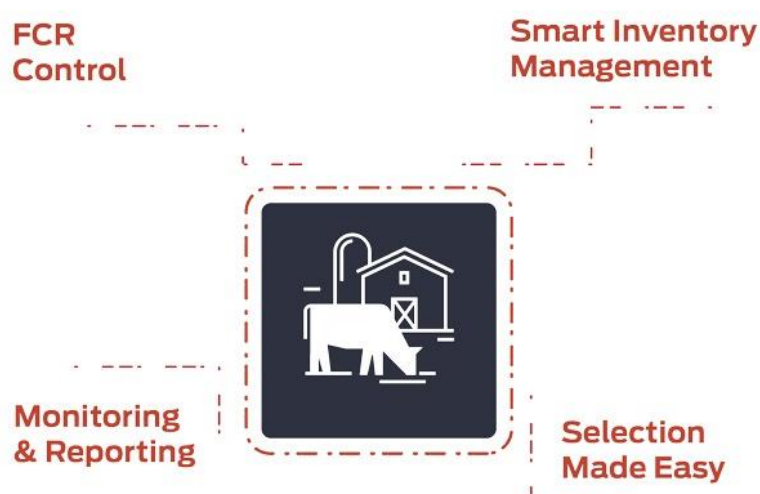
Document Synopsis: The document intends to showcase the process flow and how applications can be adopted for the different departments within an integrated livestock farm & dairy product manufacturing.
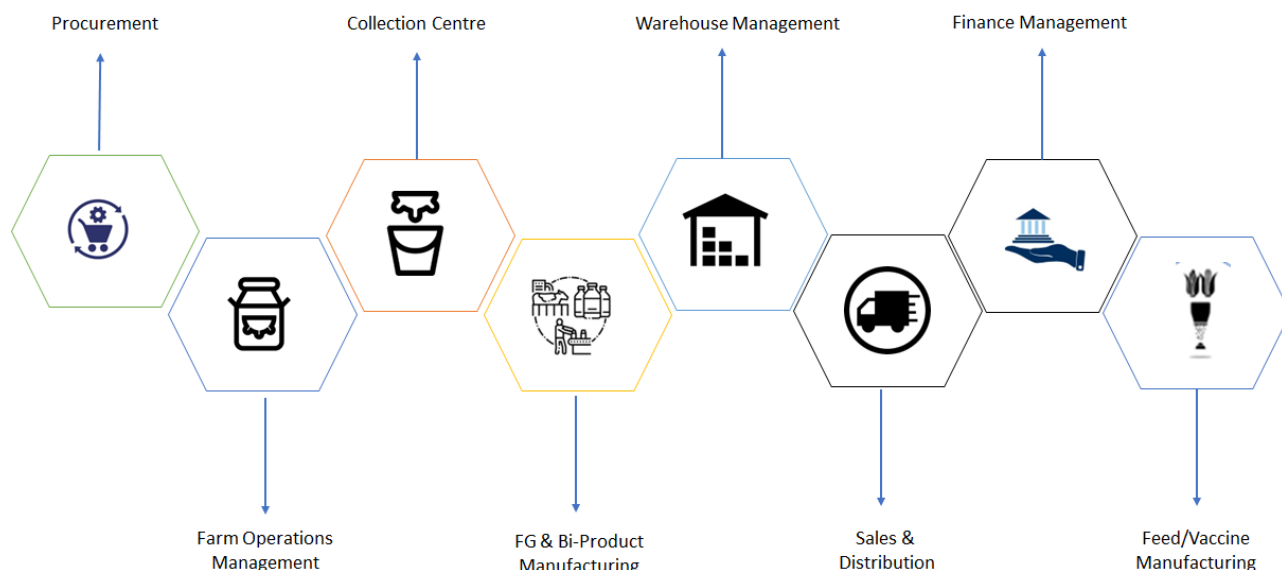
Prepared By:
Sales Management Office, navfarm.

Microsoft Dynamics 365

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1. Powerful Features –

Procurement   Collection Centre   Warehouse Management   Finance Management

Farm Operations Management   FG & Bi-Product Manufacturing   Sales & Distribution   Feed/Vaccine Manufacturing

"A great product isn't just a collection of features.
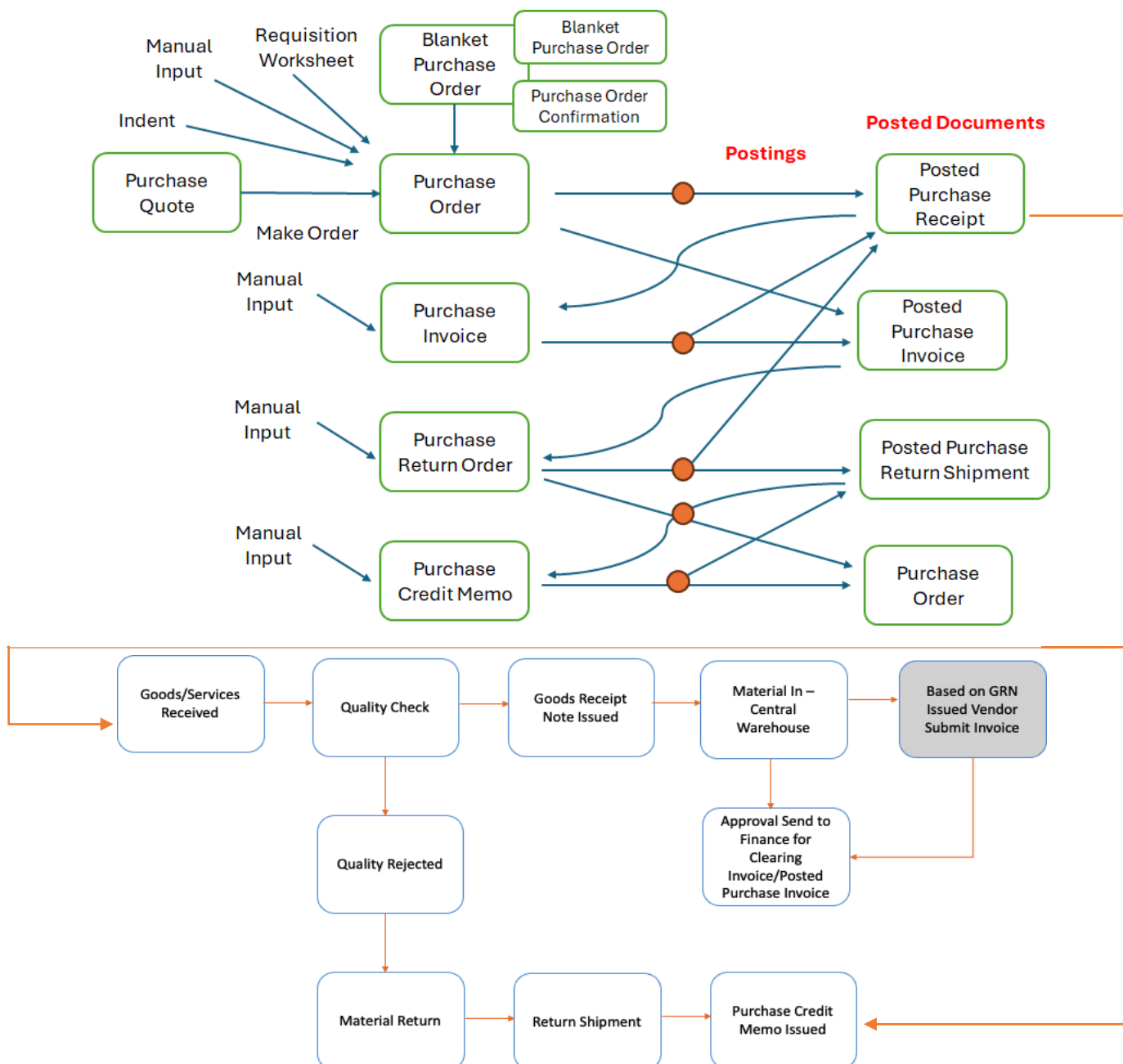
It's how it all works together."

- **Herd/Dairy Management**: Automatic Registration of births, deaths & still born, herd performance, dairy cattle movement, and record sales with multi-site/Multi herd/multi-support.
- **Cattle Breeding**: Breeding reminders, identifying breeding opportunities, enhancing dairy herd fertility, registering new calves, saving data entry time & registration costs, dairy herd performance including Pregnancy Rate and Submission rate.
- **Feed to Yield**: Record your yield and its performance concerning the feed to the herd.
- Breeding and Production: Records Active livestock, birthdates, death, stillborn calving and gestation, and breeding details with data on health, comfort, nourishment & safety tracking.
- **Last and Current Breeding**: Review last breeding dates, review pregnancy checks, and upcoming calving dates
- **Pasture Exposure and Artificial Insemination**: End to End lifecycle of natural, pasture exposure, and artificial insemination recorded both individually or in a group
- **Milking Parlour Links**: Transfer breeding information to and from most computerized milking Parlors.
- **Calving History**: See all offspring of individual livestock, including birth, weaning, and sales information.
- **Processing**:
  - o Pre-slaughter, Stunning & Slaughtering tracking with Real-time Yield control, retrieval, tracking of cuts & parts, etc
  - o Calves for veal, tracking of milk production, slaughtering due to infertility, and costing of products & by-products.
  - o Pasteurization, SNF and Fat Separator, Standardization, Pre-Heat, Chilling, Homogenization etc

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- **Feeds**: Track pasture exposure or grain feed, pharmaceutical supplements, feed-to-growth ratios, body fat, and water consumption in different breeds and weather conditions

2. Procurement Process Flow:

It all starts with the purchase, of cattle or livestock, feed, medicines, equipment, and raw material, etc. Associated or registered Vendors, lock prices, and trace to source play an important role.

Below flow is a best practice SOP used by some global successful clients.

Purchase Order

Purchase order can be comprehensive to capture information like Vendor details, statistics, vehicle details, driver name, batch details of purchased item and for location where you want the purchase to be delivered (Bill to – Ship to).

And you can also book location-based purchases. However, the payment is centralized, and the material gets shipped to the location directly. GRNs can also be done at the sub-location/batch location. Each Purchase order is registered with a lot number which comes from the supplier.

This helps in creating traceability to the source. Through transfer orders or inventory journals, the stock can be transferred to the respective shed or sub-location. Also, these items to be transferred especially livestock have the functionality to upload the serial no for animal registration along with transferred items.

Inventory Journal

3. Livestock Farming Process Flow

Navfarm is one-of-its-kind software that fits in your needs perfectly and provides you with all the benefits that you need to organize your farm and livestock practices, maintaining records, tracking the production, managing resources, analyze activities and new trends, gain important insights, and increase profitability.

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Management Dashboard and Unit Costing:

Navfarm is an integrated and Universal Farm Management Software that helps you optimize your day-to-day tasks. With Navfarm you can easily maintain farm data, like breeding records, livestock movements, and herd health and field records. Main production stages are livestock operations, backgrounding, and feedlot.

Navfarm not only enables you to monitor daily milk production records for your entire cattle herd, but also it allows you to maintain daily, weekly, and monthly summaries, like total yield per day, total yield per month, average milk per cow, month-wise lowest and highest yields, etc.

Running Batches	Sales	Expenses	Purchases	Total Running Cost	Feed
6	345,445	21,453	12,000	89,082,629	429,410

Total Livestock	Engagged Livest	Locations	Sub-Locations	Baby Livestock	UnRegistered Livest
1,000	406	4	12	230	580

Pregnant Livestock	Inventory Value	Mortality	Avg.Wt Livest(KG)		
320	34,354,324	7	100		
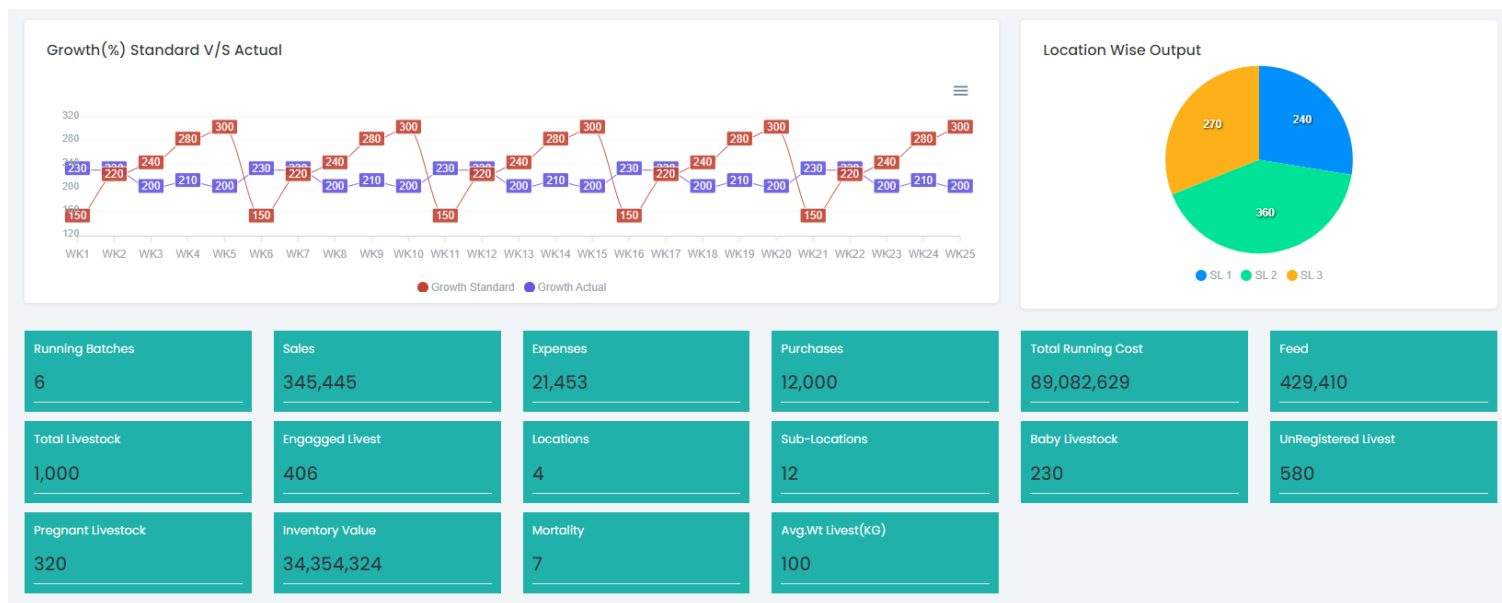
Based on the KPI, you can analyse the production of milk as per actual vs standard. Standard calculation is based on the capacity of the location an available livestock. This shall help the organization in planning accurately based on the demand.

Discover how navfarm can help you in achieving the same!

Animal Register

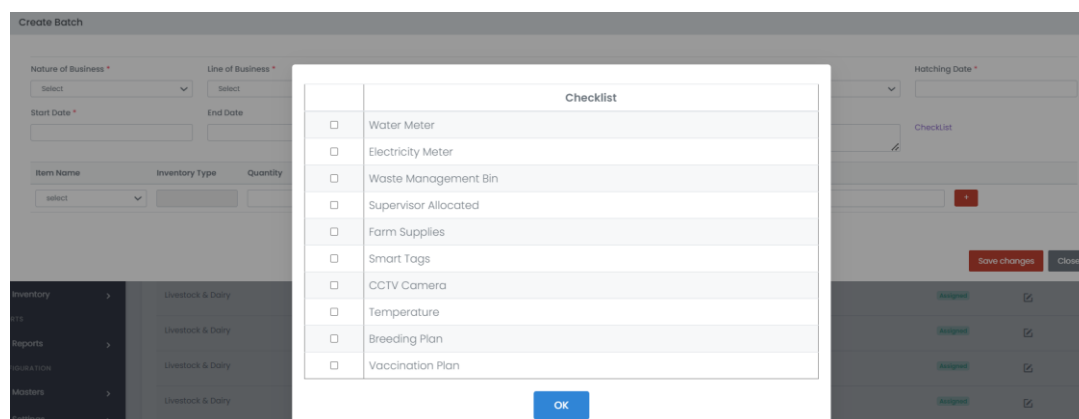|	Total No Animals	Registered Animal	UnRegisted Animal	Engage Animal	Available	Pregnant
	1000	696	304	476	406	300

Show 50 entries   Search
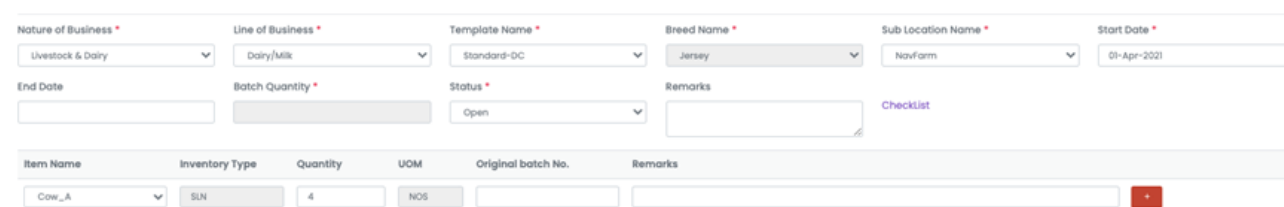
Serial No	Breed	Age	Gender	Item Name	Pregnancy	Action
101	Angus	1196	Male	Cow_R	☐	✎
102	Angus	1195	Male	Cow_R	☐	✎
103	Angus	1194	Male	Cow_R	☐	✎
104	Angus	1193	Male	Cow_R	☐	✎

Before creating the batch, the animals are registered with information like breed and tags associated.

To start with, check your farm before starting any batch. This checklist also enables you to verify automation devices like temperature, camera, tags reader etc are synched or not.

Once a batch is created with all livestock are associated you can capture the information automatically. This information can be consumable in nature like feed and medication and descriptive like body weight and temperature.

These batches are associated with the preconfigured defined SOP which control which activity must occur for that duration, associated items, UOM along with frequency at which it must occur like vaccination, feed programs, etc. The below table shows how data entry can be done effectively.

It's important to ensure the smooth entry of data by the user as we understand the scarcity of skills at the farm level. The below sheet represents how effectively the user can fill in information for each livestock with minimum effort.

Batch No	Livestock	Yield Morning|Milk|LITRE	Yield Evening|Milk|LITRE	Calves Evening|Milk|LITRE	Calves Morning|Milk|LITRE	Yield Morning|Milk|LITRE	Yield Evening|Milk|LITRE	Medicine|Medicine|KG	Fodder Male|Fodder|KG	Fodder Female|Fodder|KGS	Mortality Male|Cow_A|NOS	Mortality Female|Cow_
B00010	150	0	0	0	0	0	0	0	0	0	0	0
B00010	149	0	0	0	0	0	0	0	0	0	0	0
B00010	148	0	0	0	0	0	0	0	0	0	0	0
B00010	147	0	0	0	0	0	0	0	0	0	0	0
B00010	146	0	0	0	0	0	0	0	0	0	0	0
B00010	145	0	0	0	0	0	0	0	0	0	0	0
B00010	144	0	0	0	0	0	0	0	0	0	0	0
B00010	143	0	0	0	0	0	0	0	0	0	0	0
B00010	142	0	0	0	0	0	0	0	0	0	0	0
B00010	141	0	0	0	0	0	0	0	0	0	0	0
B00010	140	0	0	0	0	0	0	0	0	0	0	0
B00010	139	0	0	0	0	0	0	0	0	0	0	0
B00010	138	0	0	0	0	0	0	0	0	0	0	0
B00010	137	0	0	0	0	0	0	0	0	0	0	0

Animal Register

The register maintains the record of the diseased animals along with history, symptoms, diagnosed disease, treatment given and name of the veterinarian who treated. Noted benefits can be

- Check how many times livestock is vaccinated or inseminated.
- What was the disease and what treatment was provided?
- Helps in finding the commonly occurring diseases in the herd and thus formulate time precautionary measures like vaccination, deworming, etc.

Health Report Card

Sr.No	Diagnosis	Treatment	Start Date	End Date	Status	Cycle
1	Pregnent	Insemination	01-Jan-2018		Birth	1
2	Brucella	Brucellosis	05-Jan-2018	11-Dec-2018	Done	1
2	Benign theileriosis	Theileriosis	05-Jan-2018	11-Feb-2019	Done	2
3	Bacillus anthracis	Anthrax	05-Jan-2018	18-Jun-2019	Done	1
4	Hidradenitis suppurativa	H.S.	05-Jan-2018	25-Sep-2019	Done	3
5	Foot and mouth disease	F.M.D.V.	05-Jan-2018	08-Jan-2020	Done	7

Analyze your Data.

- Records provide the basis for the evaluation of animals from records hence helping in the selection and culling of animals.
- Helps in assessing the records and designing better breeding plans to check inbreeding, and selecting superior parents, and helps in better replacement and culling practices.
- Helps in disease testing of livestock.
- Helps in the detection of abnormal conditions or disease status of the herd that leads to loss in body weight, loss in milk production, etc.
- Helps in fixing proper prices of animals meant for purchase and sale.
- Helps in ascertaining the income and expenditure (economics) of dairy farms.
- To compare the herd performances in different years to determine the amount of profit/loss each year and set future goals/directions for the farm.

Start.Date	Birth.Date	Breed	Location	Supervisor	Batch No.	OP.Cost	Age Day	Age Wk
01.01.22	01.01.22	COBB	Klipview BE	Dayal Farms	B00006	868,300	167	24

OP.F	OP.M	C.Mort-F	C.Mort-M	C.Culls-M	C.Culls-F	C.Mort.	CL.F	CL.M
7,227	1,456	408	169	7	13	579	6,818	1,286

| BW-F	BW-M	Feed M	Feed F	C.Feed	FCR	Total Milk	Prod.%
2,886	3,522	11,416.51	68,099.99	79,516.5	1.28	32,121,435	1.78

Livestock Dairy Report
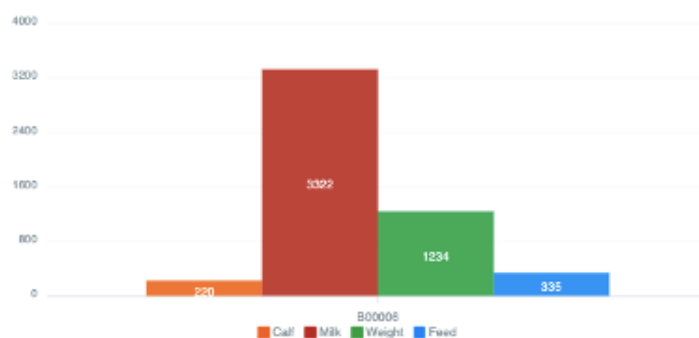
4. Cost Allocation Flow:

It's important to allocate cost of each component whether its tangible or non-tangible. In case of livestock the costing is always based on <mark>FIFO or weighted average</mark>. Below flow chart explains how the cost is getting accumulated with various tangible or non-tangible tasks performed at the farm level.

Actual lot purchase cost, consumptions at the farm level, depreciation cost, and expenses like fuel, labor, etc. all get calculated to get the accurate running cost of a batch. That cost can be further defined to get an accurate unit cost.
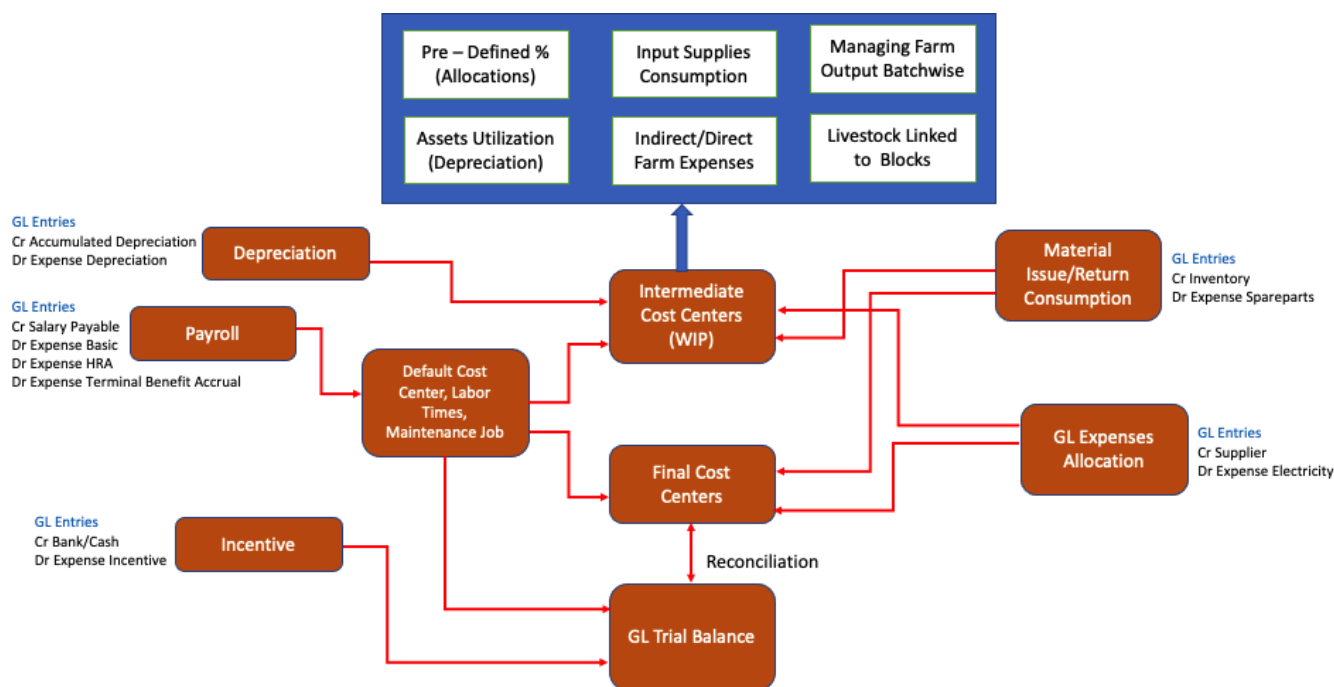
The system calculated the unit cost of an item based on the following criteria:

- Total Running cost is derivative of the following.
  - o Input consumption cost (Inventory items cost is calculated on the FIFO or standard cost) based on your preference.
  - o Direct or indirect costs like labor, electricity, or cleaning & overhead costs along with another indirect cost like insurance, etc. are added to the running cost.
- Equipment depreciation cost is also added to the running cost.
- Capital expenditures like Cattle, Feed, etc. are also added to the running cost.
- Milk Per Litre Cost = Total Milk Produce (Litres) / Total Batch Running Cost.

Advantages of cost allocation using navfarm:

- Based on the variable purchase cost, the system helps maintain the FIFO-based costing.
- Once the old stock purchased is finished, the system automatically picks the cost of purchase of new stock.
- Including Overhead cost gives more accuracy to the running batch cost along with the depreciation cost of assets.

* The impact of the cost can be measured at the unit economics which is mentioned above in the document.

5. Capacity Planning:

Ex: Milking Parlor

- Equipment based on usage UOM can be defined in the system.
- With navfarm, Equipment direct and indirect cost can be defined to derive unit cost.
- The equipment once associated with a batch, shows based on the capacity utilized.
- If Under Maintenance, you can also define the frequency and next due date.

Based on the capacity of the Equipment, the system helps you identify the allocated and available space. With which exact utilization of the system can be known.

As mentioned below is a batch with equipment allocated. Based on the utilized capacity, the system calculates the available capacity and helps the organization in planning effectively.

	Serial No	Breed	Gender	Birth Date	Pregnancy Status
☐	690	Angus	Female	02-May-2020	No
☐	689	Angus	Female	02-May-2020	No
☐	688	Angus	Female	02-May-2020	No
☐	687	Angus	Female	02-May-2020	No
☐	686	Angus	Female	02-May-2020	No
☐	685	Angus	Female	02-May-2020	No
☐	684	Angus	Female	02-May-2020	No
☐	683	Angus	Female	02-May-2020	No
☐	682	Angus	Female	02-May-2020	No
☐	681	Angus	Female	02-May-2020	No

In case if the batch planning is based on the area of the location, you can also plan the same effectively.

Each sub-location where the batch is created has a defined area.

Advantage having capacity planning with navfarm.

1. Allocation of Equipment and resources based on their actual utilization.
2. Batch Area can also help you in estimating the capacity of each batch location.
3. Breed capacity can be determined by its attributes. Etc.

Capacity Planning can be done for the following:

1. Breeding & Dairy Farm locations.
2. Consumable Inventory like feed, and vaccination can be a subject of capacity building.
3. Production capacity planning for Milk Products

Similarly, Based on Capacity, forecast can be done for:

1. Feed going to be used in Breeding farms.
2. Cattle to be produced based on future requirements.
3. Milk product production to be done annually and available production capacity.

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6. Traceability

Farm biosecurity mitigates risk by preventing the spread of diseases assuring the safety of public health. The importance of traceability in dairy includes identification of batch no., details of cattle, origin and destination, medical treatment, and vaccinations & tracing it to the source.

Below is a new batch where each item has an associated batch from which it is created and the system also indicates how much inventory is remaining for the associated batch. This also assists farm users with capacity planning.

Advantage having Traceability with navfarm.

1. Trace your supplier in case of any issue in the breed received.

2. Sold Item can be traced back to the purchaser.

3. Every nature of business Breeding, Milking, and Milk Produce are interlinked and linked with each other.

7. Manufacturing of Milk/Dairy Products

From receiving raw milk from the farms or even from the contract farmers, it goes under inspection and grading before going under the pasteurization process.

```
Raw Milk Storage → Transfer Order → GRN          Sanitization (CIP)
     ↑ ↓                              ↓                 ↓
External Farms   Internal Farms   Material      Filter Milk
                                  Inspection  → Storage Tank
```

Left branch (Yogurt):
- Heat Treatment (90°C)
- Homogenization (60°C), Add DVS
- Incubation at (45°C) and packing in cups
- Blast Cool at 8°C and Transfer to Store
- Yogurt (4°C)

Middle branch:
- Standardize yogurt mix preparation (Various ingredients) @ 50 °C
- Standardization of Fatto 2.2% and SNF 12.3%
- Fresh Chilled Milk from Storage
- Transfer Order
- Packing and storage (4°C), QC/QA

Right branch:
- Chilling (PTHE) (4°C)
- Pre-heat (50°C) → Cream → Transfer Order
- Standardize (Separator)
- Homogenization (2200 Psi) 50°C
- Pasteurization (88 °C) (HTST)
- Buffer tank for pasteurized milk cooling (5°C)

Lower section:
- Transfer Order → Central Warehouse Location
- Central Warehouse Location → Sales Dispatch ← Sales Order ← Finance
- Sales Dispatch → Customer → Payment → Bank
- Sales Dispatch → Invoice ← Finance

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navfarm

Below is a sample BOM for Vanilla Flavored Milk Base

A proper Work Center and Machine center are created in the system along with a route plan to capture the data movement flow.

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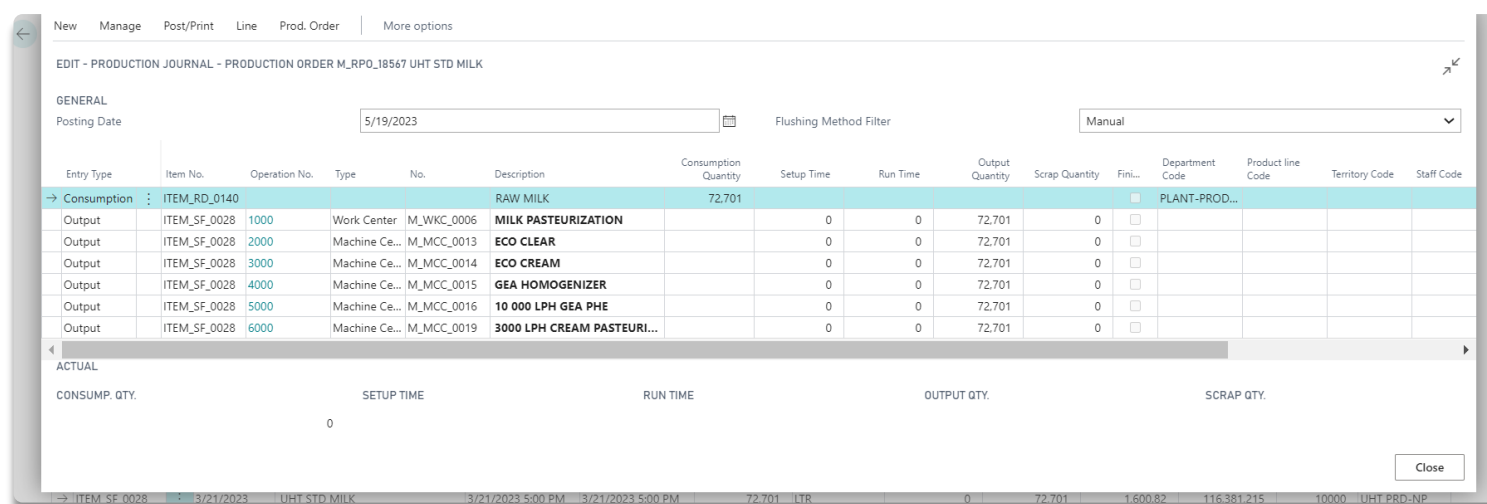
Based BOM defined, a release production order is created. Below is a standardize BOM for Pasteurized Milk

- o Input: Raw caw Milk
- o Output: Pasteurized Milk 2.8% butter fat
- o Packaging size: 250 ml and 500 ml
- o Storage: At Cooled room temperature(6-8^{0}C)

- Similarly other products like Cheese, Butter, Spread, and Ice Cream Can be produced as per the defined bill of material.
- Direct & Indirect Costs like Electricity, Gas, etc. data can be fetched directly via Scada machines.
- Cream Standardization – Data can be integrated with D365 BC
- Distribution into multiple processes. Like Yogurt, UHT Milk, etc. Weight & Volume can be integrated with D365 BC.

Sanitation is an important process and before any new batch, the CIP is repeated. The procedure for CIP includes:

- Pre-rinse water - cold water
- Caustic soda, 2%, 65-75°C, 20 minutes
- Intermediate water rinse - cold water
- Nitric acid, 1%, 55 °C, 20 minutes
- Final rinse, bacteriologically clean Hot water, 85-90 °C, before startup

A simple journal entry can be passed on to the GL account to add this cost of the activity to the actual production cost.

Before dispatch of pasteurized fluid milk to the market need to perform the following Quality control analyses.

8. Inventory & Warehouse Process Flow:

Being in a perishable goods industry, stock movement, shelf life, effectively managing supply chain and demand forecasting are some key drivers. Discover how the application helps you maintain your stock effectively, trigger for the purchase based on minimum stock level, maintain batch/lot-based stock movement (FIFO), etc.
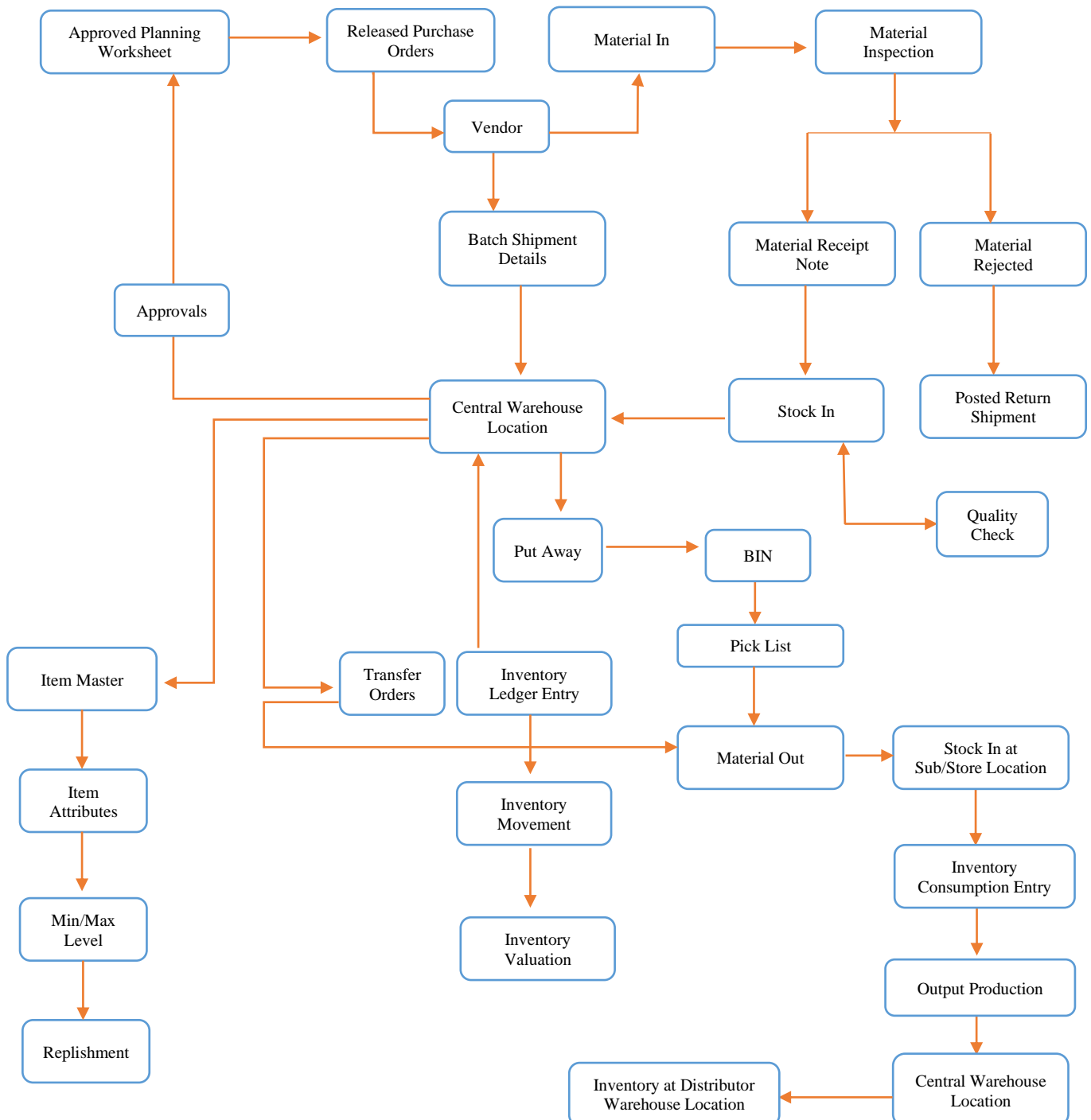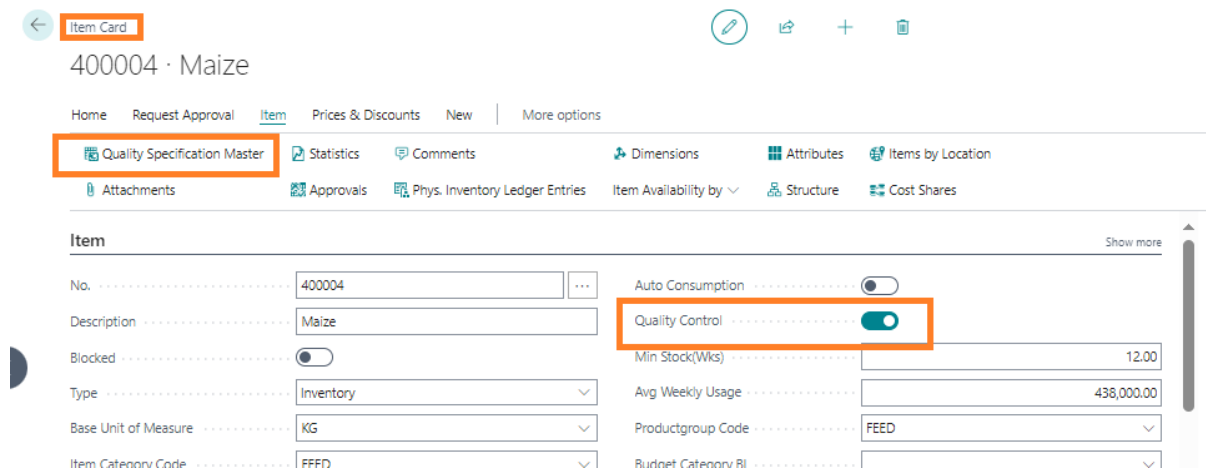
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9. Quality Inspection

Navfarm supports the QC inspection for the following during inward and outward movement:

- Animal
- Feeds
- Vaccination
- Milk
- Dairy Products

QC can be item-specific.

Qualitative and Quantitative based

Enable for Sales and Purchase along with internal transfers and sub-contracting as well.

Provide the Accept/Rejects action.

Inspection Sheet - QC/2023/0000000601 | ...
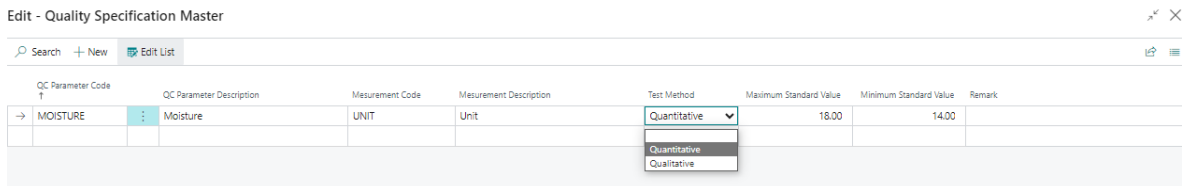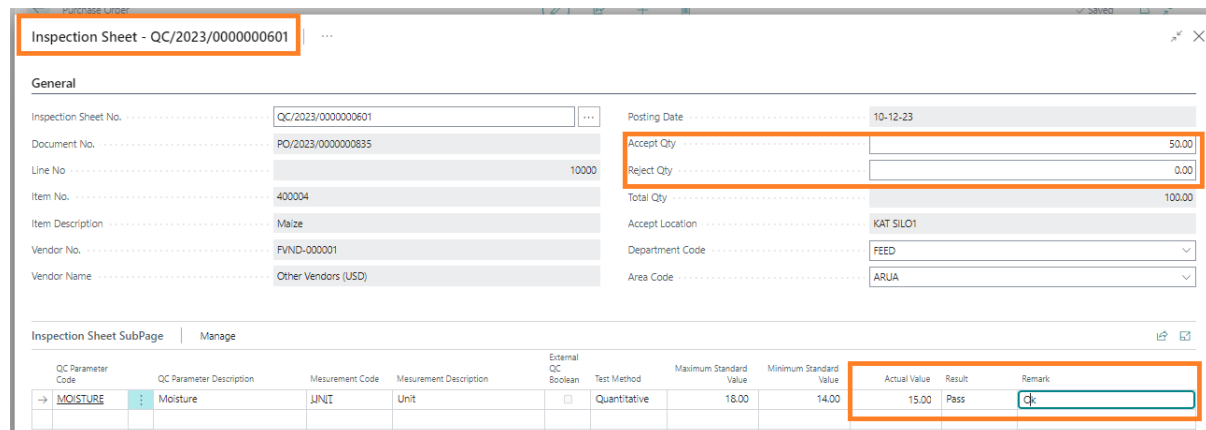
Manage	>
New	>	Accept
✓ Show as menu		Reject

General

Inspection Sheet No. · QC/2023/(...

Receiving the inspected Material will generate a Posted Inspection Sheet

Inspection Sheets   ✓ Saved   ⊡   ↗

🔍 Search   Manage   New   ⬈ ▽ ≡

Inspection Sheet No. ↑	Document No. ▽	Item No.	Item Description	Vendor No.	Vendor Name	Pos
→ QC/2023/0... ⋮	PO/2023/000...	400004	Maize	FVND-000001	Other Vendors (USD)	10

Report : Quality Inspection Report is there on Posted Inspection Sheet ribbon

← Inspection Sheets   ✓ Saved   ⊡   ↗

🔍 Search   Manage   New   ⬈ ▽ ≡

📑 Quality Inspection Report   📌

| → QC/2023/0... ⋮ | PO/2023/000... | 400004 | Maize | FVND-000001 | Other Vendors (USD) | 10 |

Quality Inspection
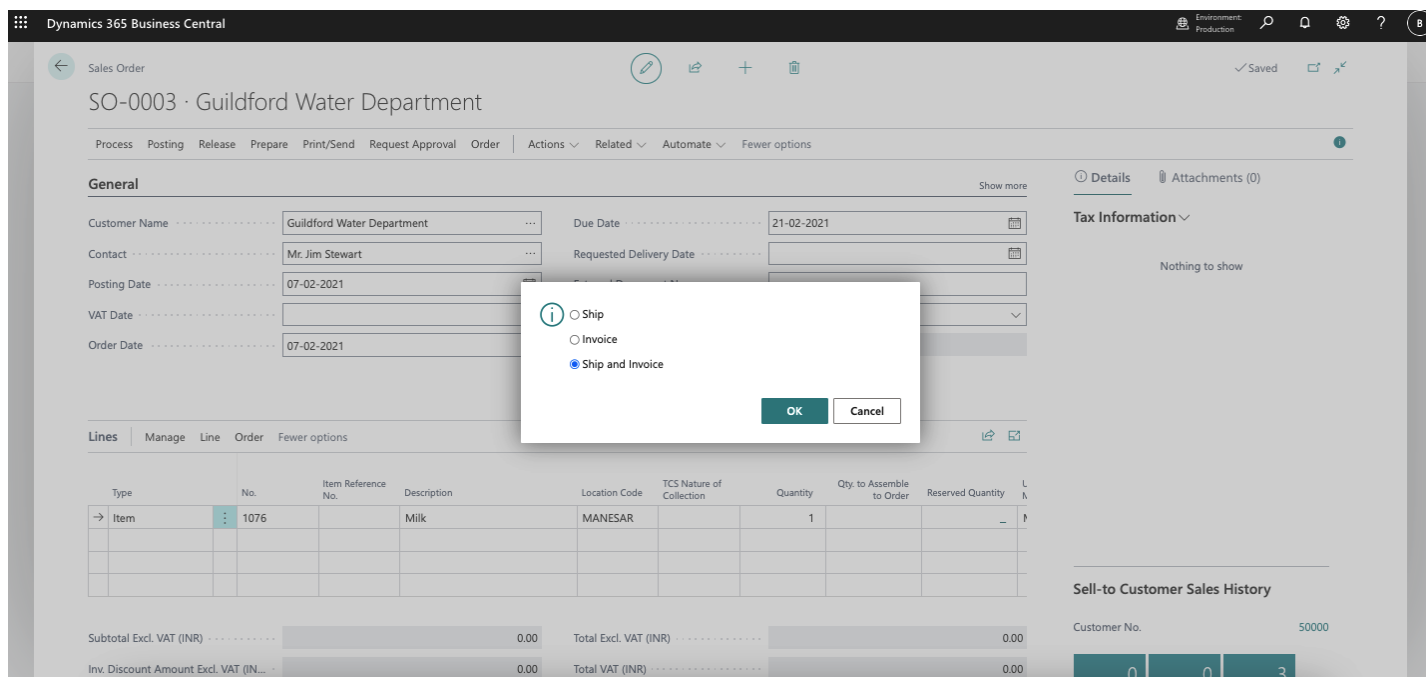
Inspection Sheet No :	QC/2023/0000000601	Posting Date :	12/10/2023
PO No. :	PO/2023/0000000835	PO Date :	12/10/2023
Vendor No. :	FVND-000001	Location :	KAT SILO1
Vendor Name :	Other Vendors (USD)		

Item No.	Item Description		Accept Qty	Reject Qty			
400004	Milk		50.00	0.00			
QC Parameter Description	Measurement Code		Max Std Value	Min Std Value	Actual Value	Result	Remarks
Moisture	UNIT		18.00	14.00	15.00	Pass	Ok
Entry By							

‹ 1/1 › — + ⊟ ⊞ ⬍ ↻ ↓ 🖶

10. Sales Process Flow:

We can post and ship the Sales Order created via the system simultaneously. This integrated with logistics helps effectively create a paperless despatch plan.

The system has also mapped though configurable price lists, credit limits, and schemes/discounts. Based on the customer preferences the same gets applied automatically.

Discount/Scheme List ▾
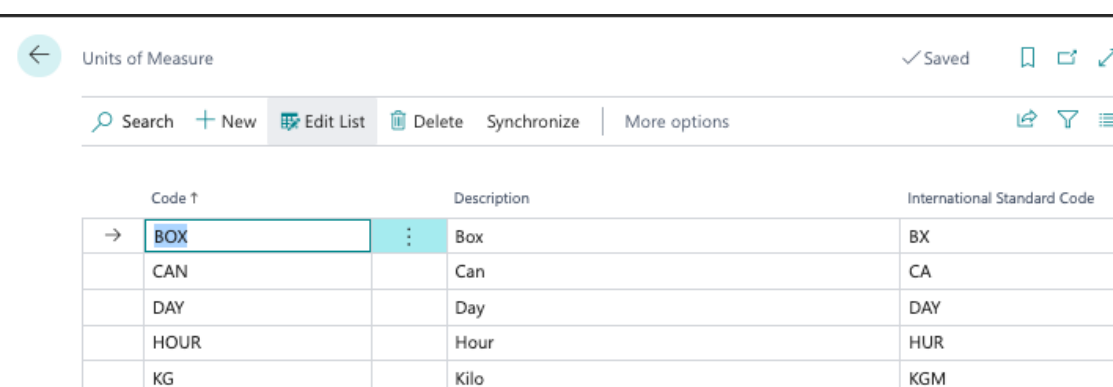
Show results:
✗ Where   Scheme No.   ▾ is   S-0593|S-0610|S-0618|S-0684
➕ Add Filter

Sche... No.	Scheme Description	Scheme Base	From Date	To Date	Disc. Group	Sch. Cal. Base	Closing Date	Close
S-0593	CD 0% 7 DAYS	Payment Term	01-04-18	31-03-19	CD	Payment Term		☐
S-0610	GA-QPD	Qty	01-04-18	31-03-19	QPD	Item		☐
S-0618	DDSEW-JK	Value	01-04-18	31-03-19	DD	Item		☐
S-0684	CPC Scheme	Value	01-04-18	31-03-19	SCD	Item		☐

The system maintains multiple units of measurement.

11. Financial Process Flow:

The general ledger (G/L) stores your financial data, and the chart of accounts (COA) shows the accounts all general ledger entries are posted to. Business Central includes a standard chart of accounts that is ready to support your business. We can do things like:

- View reports that show general ledger entries and balances.
- Close your income statement.
- Open the general ledger (G/L) account card to add or change settings.
- See a list of posting groups for that account.
- View separate debit and credit balances for a single account.
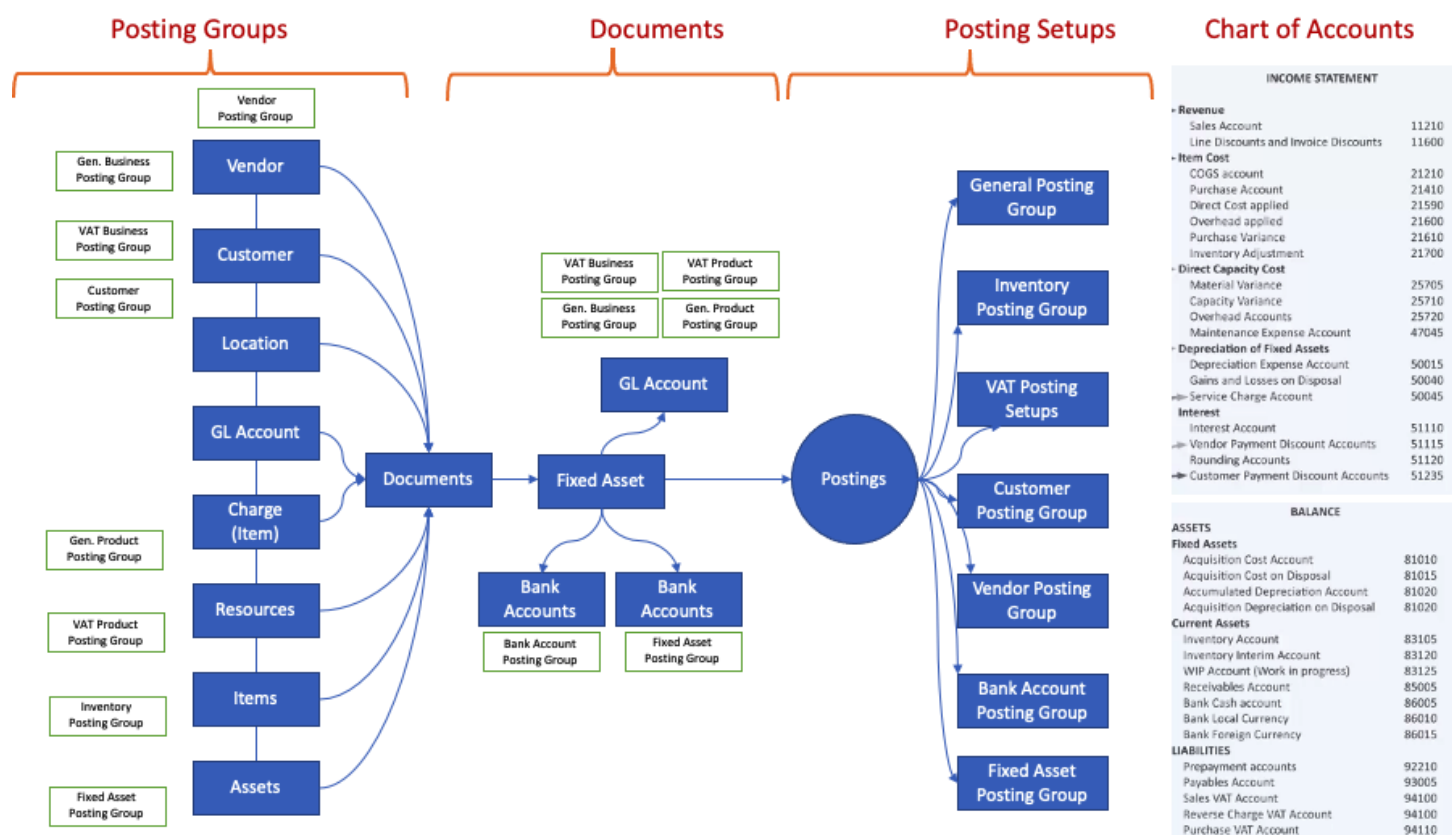
Dimensions are values that categorize entries so you can track and analyse them on documents, such as sales orders. Dimensions can, for example, indicate the project or department an entry came from.

So, instead of setting up separate general ledger accounts for each department and project, you can use dimensions as a basis for analysis and avoid having to create a complicated chart of accounts.

Fixed Asset Data Flow

The Fixed Assets functionality in Business Central provides an overview of your fixed assets and ensures correct periodic depreciation.

It also enables you to keep track of your maintenance costs, manage insurance policies, post fixed asset transactions, and generate various reports and statistics.
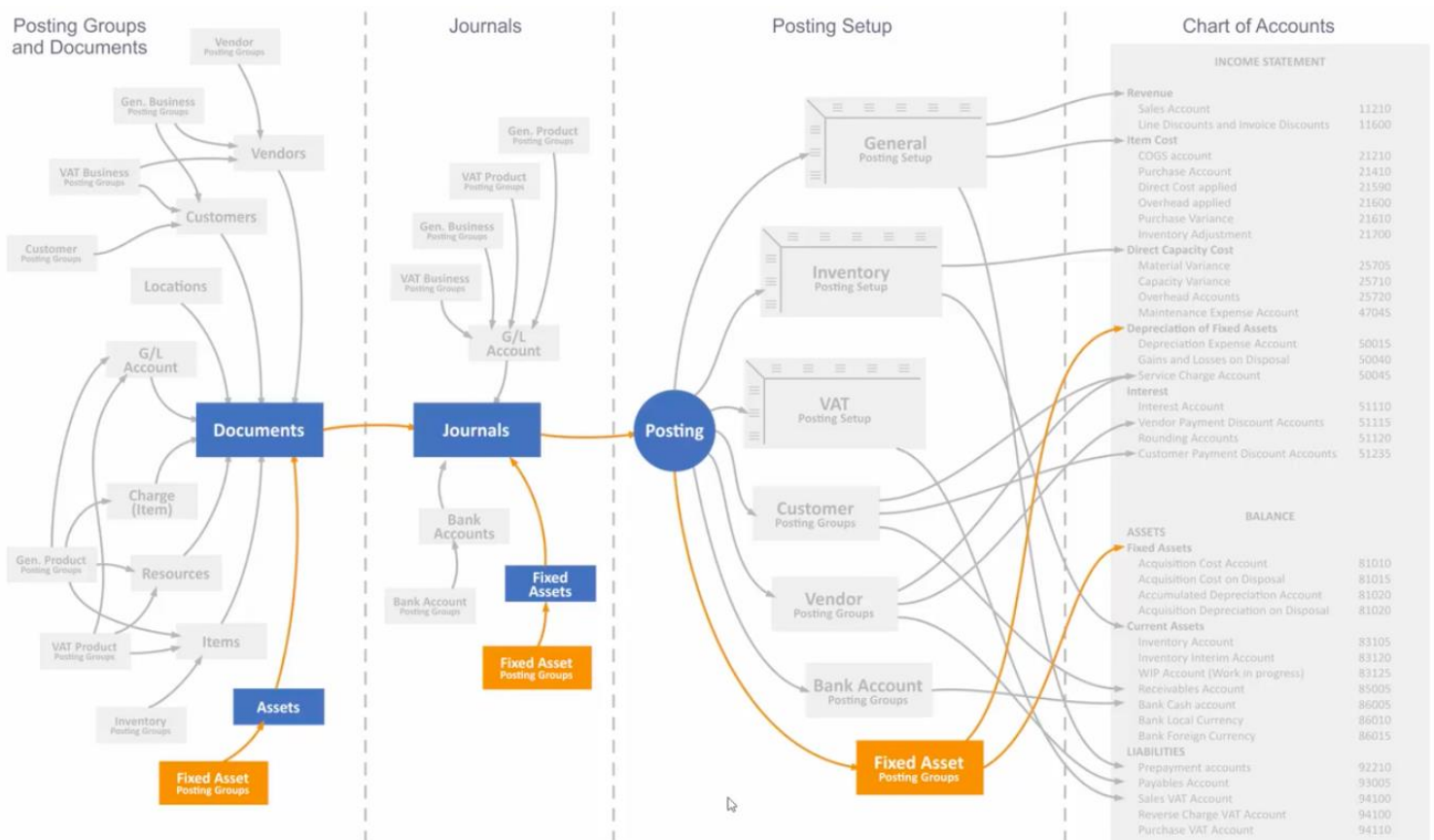
- Create fixed assets, assign depreciation methods, post acquisitions, salvage values, and print fixed asset lists. Record service visits, and post-maintenance costs, and monitor maintenance costs.

- Update insurance information, post-acquisition costs to insurance policies, modify insurance coverage, view insurance statistics, and list insurance policies.

- Reclassify fixed assets, transfer fixed assets to different locations, and split up or combine assets. Adjust values of fixed assets, post-appreciation, and post-write-down transactions.

- Calculate depreciation, post depreciation, and analyze depreciation in fixed assets reports.

- Post disposal transactions, view disposal ledger entries, and post partial disposals.

- Manage fixed asset budgets, budget acquisition costs, budget disposals of fixed assets, and budget depreciation.

12. Advantages of implementing navfarm:

There are many tangible and intangible advantages of navfarm. Below listed are a few of those how it can bring the change in your organization.

1. Complete visibility into the lifecycle.

2. Strong control of input inventory and output production.

3. Strong visibility of the Inventory.

4. Tight process control to avoid any pilferages.

5. Process-oriented Sales & Distribution with Shelf-Life Management and FIFO-based dispatch.

6. Accurate Product Costing

7. Quality Control and Inspection at Purchase, Transfers, Production & Sales

   o QR Scanning GUN Integration

   o Label Printing - GRN & Output.

   o Individual QR and Mass QR Processes

8. Inventory Traceability Report

9. Bar Code management system for reverse traceability

10. Multiple sales UOM Management

11. Schemes and Discounts Management.

12. Sales Price list dealer-wise with credit limit functionality.

13. Tight inventory control.

14. Production Planning and Control.

15. Maintain quality products in the market.

16. Strong growth and revenue generation.