ASCM CASE COMPETITION

In collaboration with Deloitte.

Moo Homestead

ASCM CASE COMPETITION SCHOOL ROUND 2020-21

ASCM ID : 2208863

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Moo Homestead is a wholesale milk distributor in the US, with a regional footprint concentrated in the northeast.

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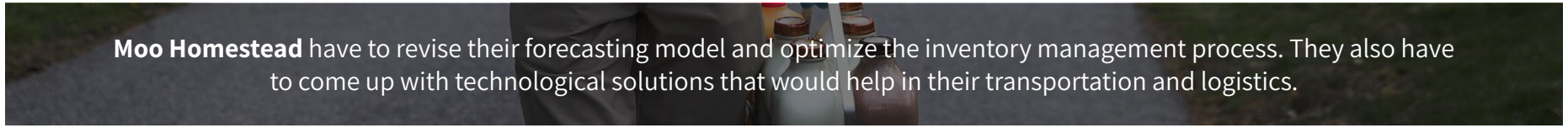
Consideration

Moo Homestead is a leading wholesale milk distributor. Due to COVID-19, they realized a sudden shift in the demand of milk. As a result, their complete system got disrupted and the anticipated supply chain forecasts turned out to be highly inaccurate. The transportation system got a hit due to COVID protocols, due to which they have to restructure their entire logistics process.

Objective



Moo Homestead have to revise their forecasting model and optimize the inventory management process. They also have to come up with technological solutions that would help in their transportation and logistics.

Strategy

Forecast Analysis & Demand Planning	Inventory Management	Transportation Solutions
Analysing demand forecast showed product categories in restr./catering had highest +ve mean error, & saw maximum unit sale decline during pandemic.	The Fill rate and inventory management were at the lowest point in july 2020 for all the distribution channels. This outcome is due to the pandemic induced logistic inefficiencies.	Introducing a **digital tracking platform** which will give consumers and vendors options to choose and help prioritizing fleet according to the chosen option.

The pandemic has forced Moo Homestead to restructure their entire supply chain, right from the forecasting demand aspect to transport operations. With the inefficiencies pointed out by us, and implementing the mentioned tech solutions, the pandemic shall prove a blessing in disguise, helping Moo Homestead ein the longer term.

Forecast Analysis - Margin Erosion & Financial Impact during pandemic.

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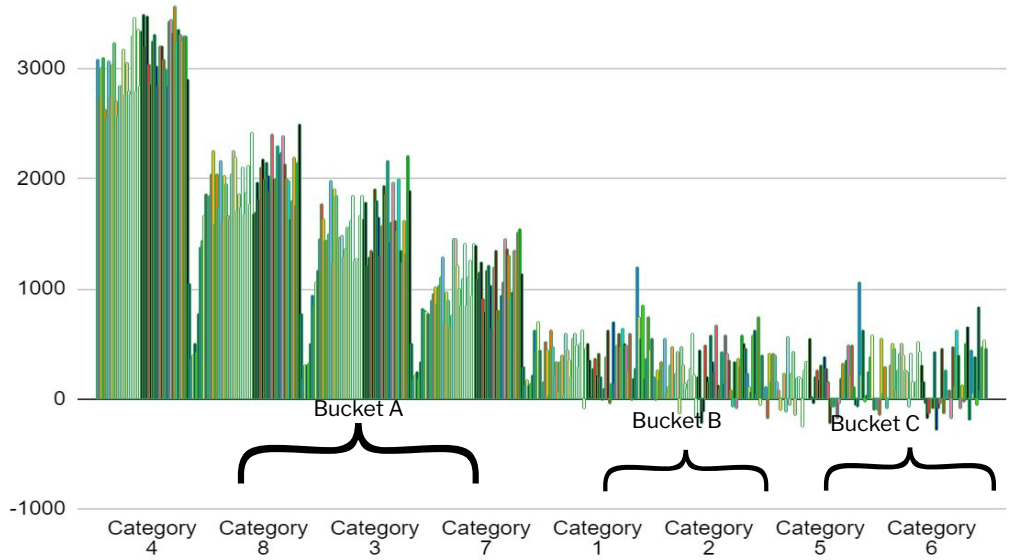
We categorised products for ABC Analysis based on profit generation.



Analysing A, B and C's individual curves for cost, revenue, profit and quantity sold, has given clear reasons for the trend change:

Bucket Distribution

	Bucket A	Bucket B	Bucket C
	CATEGORIES		
	4, 8, 3, 7	1, 2	5, 6
	Profit Generation →		
Distribution Channels	Restaurants & Catering	Supermarket & Grocery	Supermarket & Grocery
Type	4, 8: Whole milk 3, 7: Skimmed milk	Whole Milk	Skimmed milk

Forecast Analysis Excel Model

Forecast Analysis - Margin Erosion & Financial Impact during pandemic.

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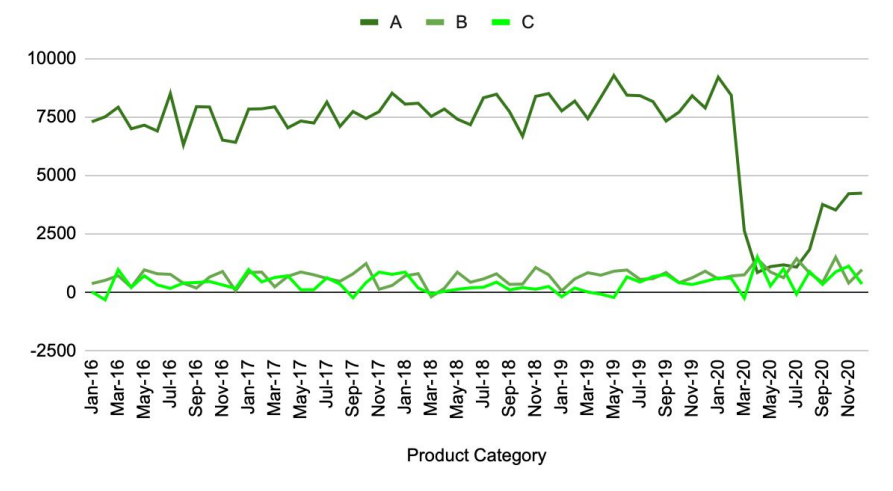
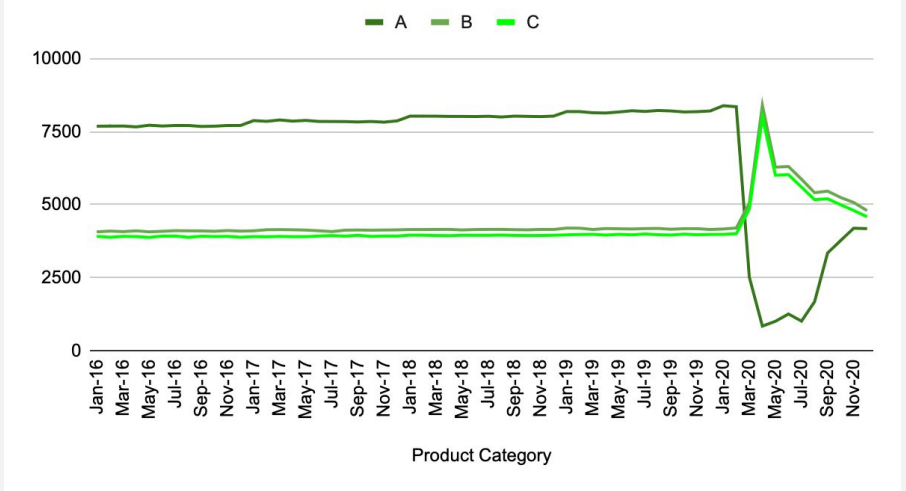
Gross Profits



During the pandemic, the gross profits for Bucket A which consists of Whole and skimmed milk for channels Restaurants and catering fell sharply. This can be attributed to the crash of the hotel and tourism industry leading up to the pandemic. We can see a steady recovery in the same matching the end of the first wave.

Quantity Shipped



The gross profits of Bucket B and C saw little change as these buckets constituted of milk being consumed in grocery and SMKT. As people grew health conscious the quantity shipped of these categories increased

Forecast Analysis - Margin Erosion & Financial Impact during pandemic.

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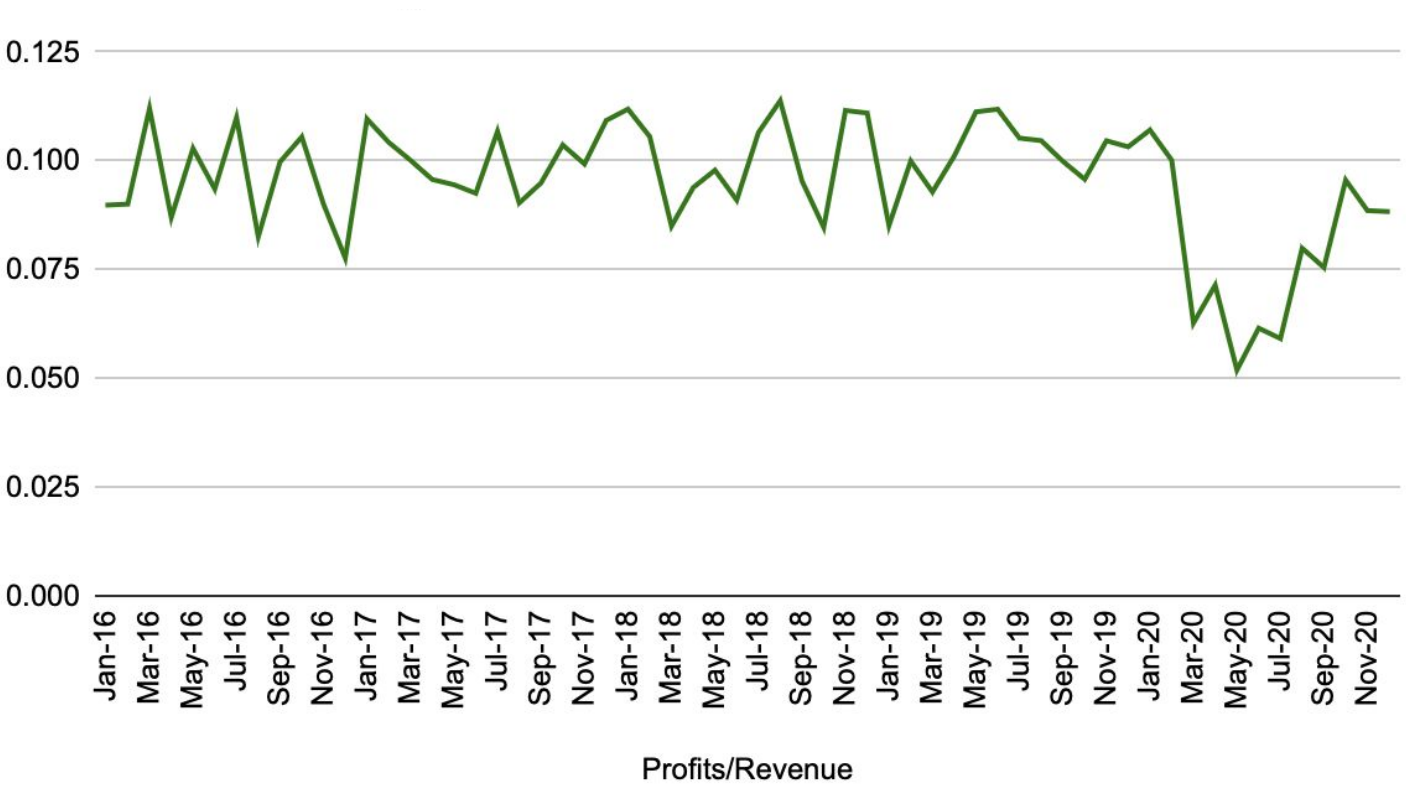
Gross Profit Margin



Bucket A, which includes products of Category 4, 8, 3 and 7, contributes to an enormous **75%** of the company's revenue.

During the pandemic, revenue from Bucket A fell by as much as **80%**

Units sold in Buckets B and C rose by almost 100% in the same period.

During pandemic, revenue per unit for Buckets B and C rose by 15%, but costs rose by 27%, thereby cutting margins.

Forecast Analysis - Mean Absolute Percent Error (MAPE) Calculation

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Packaging	Product Category	MAPE	Bias
HDPE Jug	Category 1	**0.317**	**-1**
HDPE Jug	Category 2	**0.317**	**-1**
Plastic Bag	Category 3	**0.599**	**1**
Plastic Bag	Category 4	**0.599**	**1**
HDPE Jug	Category 5	**0.321**	**-1**
HDPE Jug	Category 6	**0.321**	**-1**
Plastic Bag	Category 7	**0.600**	**1**
Plastic Bag	Category 8	**0.600**	**1**

- Demand for all products with Plastic Bag packaging were over-forecasted.
- Demand for all products with HDPE packaging were under-forecasted.
- Plastic bag packaging is used in case of all Restaurant/Catering supplies, while HDPE Jugs are used in SMKT/Grocery shipping.

Packaging	MAPE
HDPE Jug	**0.319**
Plastic Bag	**0.599**

INFERENCE

Restaurant/caterers (B2B) have variable demand (esp. dueto pandemic) and stronger negotiating power.

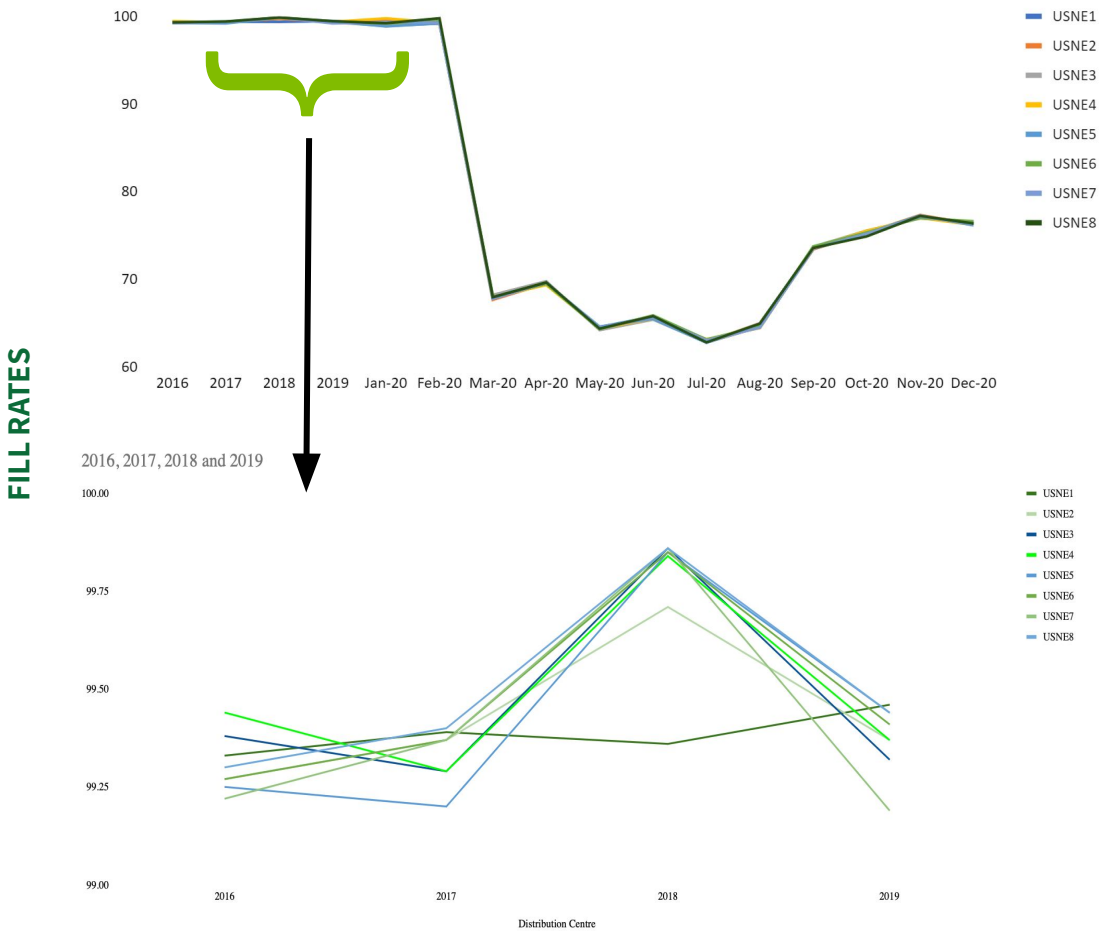
Groceries/Supermarkets (B2C) have fixed demand and lowed negotiating power.

The problem statement demanded calculation of MAPE for all product categories and Packaging Mixes for 2020

Assumptions & formula used:

- MAPE = |Forecasted Quantity – Actual Shipped Quantity | / Forecast
- Bias Tracking Point: [Forecasted Quantity – Actual Shipped Quantity] / |Forecasted Quantity – Actual Shipped Quantity|
- MAPE values across months have been averaged
- Since, data point for individual products were provided separately for each DC, forecasted demand of DCs has been used a weight for averaging across DCs.
- Same weight has been used while calculating MAPE of packaging mixes

Inventory Management - Average fill rate for different distribution centres



The Average fill rates before the pandemic for all the distribution channels was **99.5%**

The Average fill rate post pandemic for all the distribution channels fell to **70.45%**. This can be improved with proper demand forecasting

The average fill rate was the least for distribution centre one indicating the need for a better management system for that centre

Distribution Centre	2016	2017	2018	2019	2020
USNE1					
USNE2					
USNE3					
USNE4					
USNE5					
USNE6					
USNE7					
USNE8					

Increasing fill rate

Inventory Management Excel Model

Inventory Management - Inventory turnover

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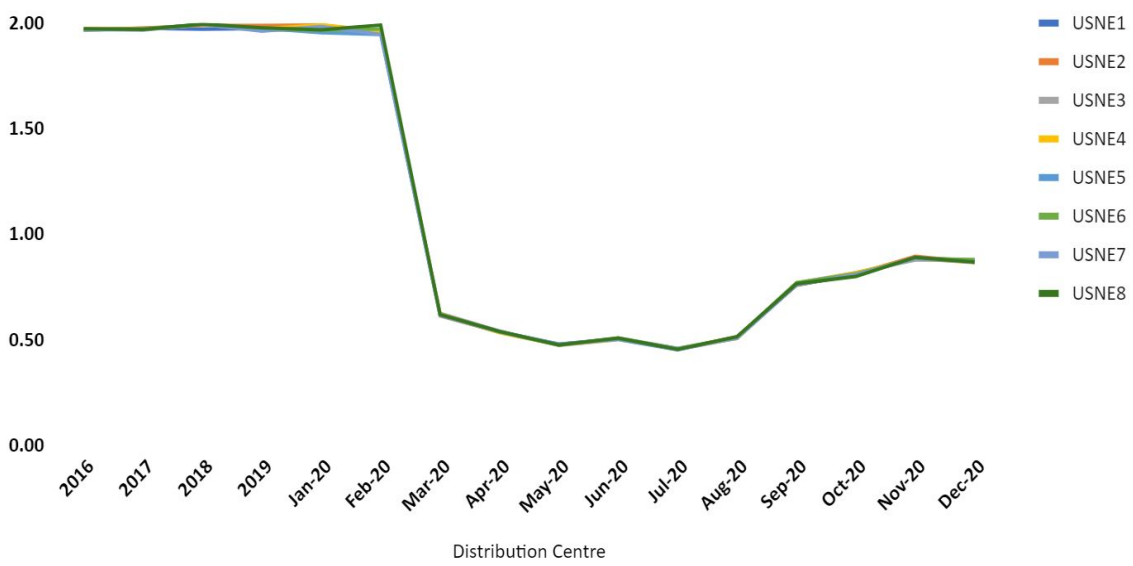

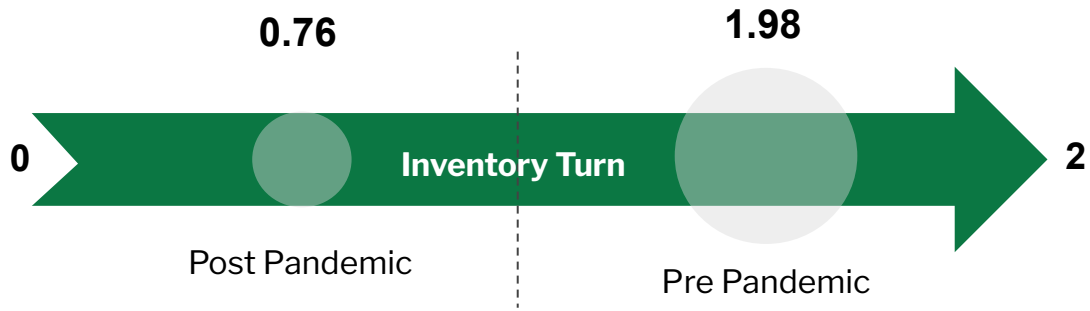

After calculating the inverturns we found that they are lowest in the month of july 2020. Reason seems to be the pandemic induced logistics and supply chain management inefficiencies.

Lower ratio Indicates Moo Homestead did more stocking than required during pandemic.

+

Generally, a low ratio signals bad sales or surplus inventory

- Better Forecast
- Focus on selling top selling products
- Eliminate safety Stock and old inventory
- Reduce purchase quantity

To identify opportunities to increase cost savings and improve overall efficiency across the inbound transportation division

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35%

Inbound freight managed by Moo Homestead

1) Use Location and idle time mapping of outbound vehicles to use them for viable inbound transportation.
2) Identification of top freight lanes and focus on increasing control in these lanes via:
Third party vendors/contracts, backhauling outbound freight allowing a given route diversion.
3) Backhauls: Use company-owned trucks returning from Customer Deliveries for Inbound loads from vendors near DCs/Depots

1) Load consolidation: Consolidate multiple LTL Shipments into FTLs
2) Freight sourcing: Switch current FOB/Collect Lanes managed by the company to a cheaper carrier/broker
3) combine shipments with other companies that are operating in the same freight lanes.

Deadhaul % :Deadhaul Distance/ Total Distance travelled
Freight Cost Per Unit : To measure cost effectiveness of all the strategies implemented
Turnaround Rates : To assess loading and unloading efficiency

Launching a **digital platform** to keep track of freight market data and potentially induce fleet prioritization to increase inbound freight

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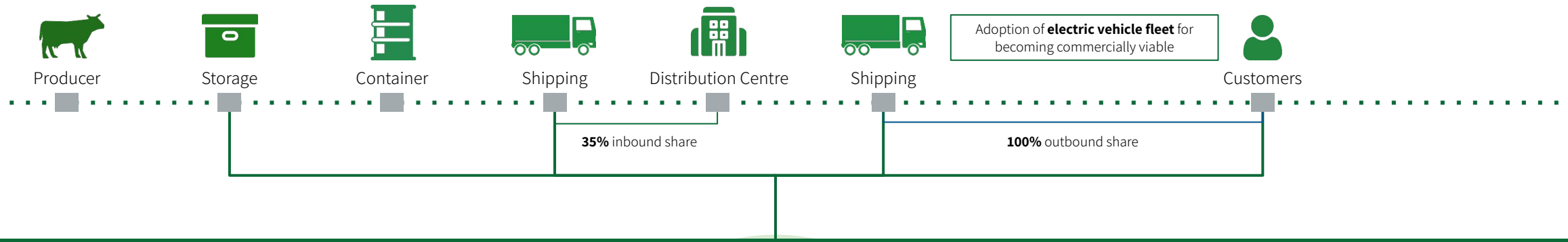

The digital platform will allow Moo Homestead's customers and vendors to effectively economically choose from cheap and effective options according to their preference and urgency

Digital tracking platform to keep track of the inbound and outbound freight

Adoption of EV fleet

Option of electric vehicle will provide cheaper and sustainable transportation solutions

Fastest, cheapest, Most Reliable

Inbound Distribution Channels and outbound customers can choose between quotes

Customers and vendors gain transparency and shipment options that fits them the best with an option of choosing **EV fleet**

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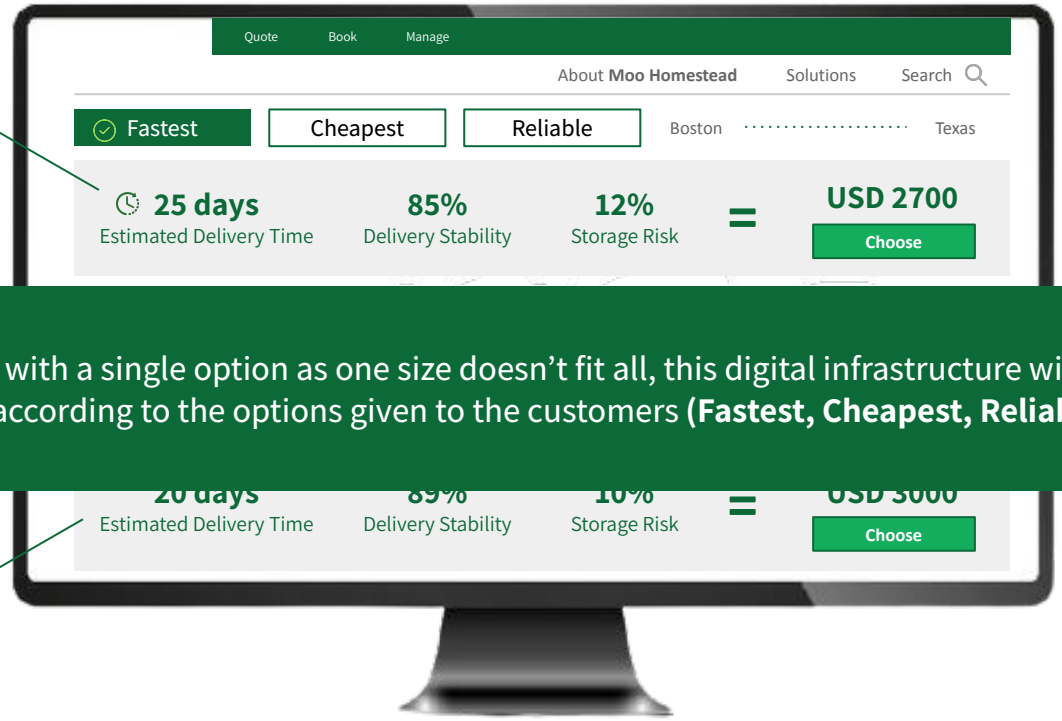
Increasing the share of inbound freight for Moo Homestead

Current logistic partners

DHL · UPS · XPO Logistics

The digital tracking platform will help prioritize between orders and will ultimately increase the **inbound share**



Addressing the fact that not everyone one is satisfied with a single option as one size doesn't fit all, this digital infrastructure will help track the freight and prioritize the fleet allocation according to the options given to the customers **(Fastest, Cheapest, Reliable)**

Cost reduction due to adoption of Electric vehicle fleet

Adoption of EV fleet will help in overall reduction of fuel costs by **~40%** and help achieve the global sustainable goals.

Moo Homestead should adopt the **circular economy** model to reduce the overall waste in the SC delopving glass bottles

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These glassed bottles collected from the customers by Moo Homestead's collection trucks will then reach the distribution channels. There these bottles will be **sanitized and will be processed for reusage.** This whole process will reduce the overall waste in the supply chain as a whole

The bar code attached to very bottle will help keep track of the bottles and will ultimately result in efficient route tracking

Every bottle is have a **bar code** specific to a trait which can be tracked using the **blockchain technology**

Customers are transported these glass bottles by our outbound logistics (EV fleet).

Our collection trucks will collect these bottles next day

The whole **circular economy** framework will ensure reduced waste and spoilage.

With our proposed strategies, we believe that **Moo Homestead** can improve its overall supply chain solutions.

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Conclusion 1

Demand for restaurants/caterers was over-forecasted while for groceries/SMKT was under-forecasted. Demand forecast requires significant modifications. Even after a spike in grocery/SMKT products during pandemic, profits went down by 65%, as the restaurants/caterers (which holds 75% market share) was hit very badly.

Conclusion 2

The fill rates strongly depicts that there are a lot of factors involved including the pandemic, seasonality, accuracy in demand forecasting, safety factor and inventory turnovers. To increase the fill rates, our forecast need to be as close as the actual forecast. Moo Homestead have to identify the channels where there's a need of safety stock to compensate for the increased demand and order extra safety stock according to the demand forecasts in order to reduce customer dissatisfaction and unnecessary high on-hand inventory.

Conclusion 3

The Electric vehicle fleet will allow Moo Homestead to save on fuel costs and reduce the overall transportation cost by approximately ~40%. With the help of the new digital tracking platform, vendors can choose from the 3 logistics options: Faster, Cheaper and reliable transportation. They can also keep a track of market data so as to allocate fleet into inbound and outbound transportation and prioritize based on the order type from the 3 available options.