ASHUTOSH AGARWAL

Approach & Result Document

Have some open questions regarding the data for **Problem 1**. Primarily around Day by day change in stock available which seemed to be not in sync with the other variables like **Last GRN qty at Store** & **Stock in transit**. Would have been able to do a more comprehensive analysis if the below doubts were clarified.

1. There is no clarity on when the stock in transit reaches the store
2. Below interpretation of **Last GRN qty at Store** and **Last Good Receipt Note (GRN) date at Store** leads to results which seem to be out of sync with other values

   Assuming that **Last Good Receipt Note (GRN) date at Store** denotes the date on which the stock was received but is not available for sale on the same day**. Last GRN qty at Store** given against a system date is the quantity which becomes available for sale on that date in addition to the value given in the column **AVAILABLE STOCK (Units).** For instance, for the below data point, it was assumed that the 28-May-2016 was the date when stock was received at store, but it became available for sale on 8-June-2016. Thus, total stock available for sale on 8-June-2016 was 471.

Date	(Units)	Store	Store
6/8/2016	172.00	5/28/2016	299

   Based on above assumptions, daily sales were calculated based on a day by day change in available stock. But, these daily sales didn't match with the last 14 days actual sales values

I believe this could be driven by insufficient data given on stock in transit or because of some discrepancies in data related to **Last GRN qty at Store** and **Last Good Receipt Note (GRN)** date at Store against a systems
date

Constrained by above doubts, were able to infer limited insights as summarized below.

1. **<u>Daily average sales quantity</u>** was calculated for each product at every store using the **"Actual Sale in Last 2 weeks (Total)"** data. The sales for last 2 weeks were first converted to sales quantity by using the **"Retail price"** and then an average was taken.

Daily Average Sales						
Products	Chandannagore Depot	Howrah Depot	Hugli Depot	Kolkata Depot	Nadia Depot	North 24 Parganas Depot
Natural Sour Apple Cocktail 3.2 litres	124	193	114	246	97	144
Penne with Roasted Vegetables 4.5 kg	123	188	114	232	99	146
Pinapple Chunk 8 kg	126	194	114	245	96	147
Sugar 5 kg	123	200	109	231	100	150
Vintage 12 Yr Old 700ml	121	193	114	236	96	145

Below insights were inferred from the above analysis:

Kolkata Depot has the highest sales for all products
Each product is sold in approximately same proportion of the total sales at each store

2. As observed from the data below, the actual lead time (days) from DC to store (calculated by taking average of **"DC to Store Lead Time"**) and ideal lead time (days) had huge differences.

Depot	Average Lead Time(Days)	Actual Lead Time(Days)
Chandannagore Depot	12	9
Howrah Depot	10	7
Hugli Depot	22	15
Kolkata Depot	5	3
Nadia Depot	23	18
North 24 Parganas Depot	18	12

Therefore, it is suggested that Depots should take steps to reduce the actual lead time (days)

3. There were huge differences between the average quantity received at store denoted by "**Average GRN Quantity**" in the below table (calculated by taking average of **"Last GRN qty at Store"**) and **Sales** (calculated in the first point). Almost all the products were ordered in quantity less than required as indicated by sales. Cells highlighted indicates the products which were ordered in quantity more than required. This indicates that stores were not able to predict sales correctly.

	Apple Cocktail 3.2 litres	Roasted Vegetables 4.5 kg	Pinapple Chunk 8 kg	Sugar 5 kg	12 Yr Old 700ml
Chandannagore Depot					
Average GRN Quantity	97	215	84	71	113
Sales	124	123	126	123	121
Gap	-27	92	-42	-52	-8
Howrah Depot					
Average GRN Quantity	44	27	125	53	44
Sales	193	188	194	200	193
Gap	-149	-161	-69	-147	-149
Hugli Depot					
Average GRN Quantity	68	224	63	52	20
Sales	114	114	114	109	114
Gap	-46	110	-51	-57	-94
Kolkata Depot					
Average GRN Quantity	30	180	256	84	238
Sales	246	232	245	231	236

Gap	-216	-52	11	-147	2
Nadia Depot					
Average GRN Quantity	164	25	156	143	61
Sales	97	99	96	100	96
Gap	67	-74	60	43	-35
North 24 Parganas Depot					
Average GRN Quantity	307	60	114	54	177
Sales	144	146	147	150	145
Gap	163	-86	-33	-96	32

Stores should implement some models that could predict their sales appropriately

4. Time taken by the product to reach the shelf from the store warehouse is very high. This is calculated by averaging "**Days since last GRN at Store".** As mentioned earlier, it has been assumed that the day on which the product become available for sale is later then its delivery day.

	Depots					
Products	Chandannagore Depot	Howrah Depot	Hugli Depot	Kolkata Depot	Nadia Depot	North 24 Parganas Depot
Natural Sour Apple Cocktail 3.2 litres	6	8	6	2	5	10
Penne with Roasted Vegetables 4.5 kg	11	10	6	11	4	3
Pinapple Chunk 8 kg	3	6	7	10	5	3
Sugar 5 kg	11	8	3	8	10	2
Vintage 12 Yr Old 700ml	4	3	2	10	11	6

Suggestions

Stores should take measures to reduce this time and to ensure that the stock is available for sale within 1-2 days after the orders are received from depot.

It is observed that for few products this time is very less from which it can be concluded that stores can reduce this time but are not doing it properly.