

Managing Inventories At Fast Food Outlets: A Study On The Operations Of Fast Food Outlets

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ABSTRACT

To stay ahead in competition managing inventory is the need of the hour. Even in supply chain, companies' emphasis on the inventory management. Inventory management is a subset of the broader Supply Chain Management and mainly aims at achieving the customer demands while increasing the service level and quality and decreasing the total costs. The goods and products must be at the door step at the correct time in correct quantity. Silchar is an important commercial centre of the Barak Valley Region of Assam, India. Since many years which has led to the migration as well as influx from neighbouring places resulting in a huge population. With urban development, the concept of ready-cooked food for sale and the desire to eat out has become a trend. People not being able to visit expensive restaurants prefer eating in the fast food outlets which serve their purpose at a much cheaper rate. To compete and survive in such a cut-throat competitive market, every fast food brand is planning various strategies. One such option is the implementation of proper inventory management practices in the fast food sector.

Keywords: Inventory Management, Shelf life, Stock-outs, Wastages & Supply Chain

I. INTRODUCTION

Every manufacturing firm needs to give emphasis on the management of inventory. It all done to avoid stock out as well as wastages due to excess inventory. The issues of inventory management generally deals with the data related to the past demand pattern as well as the lead time. Managing inventories of any business particularly manufacturing need to take into consideration of stock out cost, ordering cost and carrying cost for its operations. Thus need to understand the complexity of service level situations in ordering system. The main purpose of inventory management is to determine 'how many units to order' and 'when to order'. Most of the companies keep safety stocks to overcome the problem of stock-outs or shortages but the area of interest of this study is the fast food sector which has a very limited shelf life. There are several different types of inventory and inventory of perishable items is one of them. For this reason, inventory management of perishable items is more important than that of durable products.

Fast food and eating out has dramatically grown in India in the past 20 years. Regardless of the age group and the place of residence, fast food is a cuisine that has become the universal favourite among all food enthusiasts.

The restaurants in Silchar city of Assam, offer a variety of dishes ranging from authentic Bengali and Assamese cuisines to delicious Indian and Chinese food. Although rice is the staple food of the people of Silchar, people here love to experiment with their food. Silchar has all kinds of fast food outlets ranging from the MNCs- KFC, Domino's Pizza, Subway, Pizza Hut to properly maintained restaurants to even street side joints.

II. NEED OF THE STUDY

Inventory management is very vital for any business because any mistake in the inventory results in the biggest expense if not managed effectively. Having too little inventory or too much inventory can result in depletion of the resources to high levels if not managed properly. The present study will help the vendors of the fast food outlets in Silchar to understand what aspect of inventory management needs to be changed in order to meet the customer's expectations.

III. REVIEW OF LITERATURE

Inventory management is considered as a major issue in every organization. Inventory is the basic and fundamental ingredient of any business. Tyagi during 2014 proposed an optimization of inventory model to

highlight the different stock conditions where he developed a multi objective mathematical model for the location-distribution problem based on a case study on real-world for a municipal district in Tehran.

The practice of inventory management varies from organizations to organization. Broekmeulen, R.A.C.M. and Bakx, C.H.M. during 2013 highlighted that by issues of batches. Further the work pointed out that the retailer can reduce the amount of outdating due to LIFO withdrawal at the expense of additional handling.

The issues related to lead time, lot size, stock outs etc are utmost important in the practice of inventory. Abad in 2003 discussed the problem of dynamic pricing and lot-sizing for a reseller with the approach of perishable goods. Further the product price can be varied within the inventory cycle considering the time span of the product and the value drop associated with it.

Linh during 2015 highlighted and proposed a solution for the problem of inventory management in a more sophisticated manner with detail analysis. Although there are variety of ordering systems in the inventory system, the organizations practice basically P system, Q System and Hybrid System of ordering system. Fries during 1975 have analysed fixed-life perishable inventory problems under different set of conditions.

Weiss in 1980 presented the problem in a continuous review framework. Further the study highlighted on costs concerned with ordering, holding, shortage, etc. Broekmeulen and Van Donselaar during 2009 discussed the problem on replenishment policies for a single echelon perishable inventory system. From the overview of the socio-economic characteristics of street vendors in Shillong, Borah during 2014 infers that street vendors play a vital role in the city's economy.

IV. RESEARCH GAP

Based on the literature review it has become evident that there were very less work has been done on the inventory management of the fast food outlets, especially on the inventory management of the fast food outlets of North Eastern States' Cities.

V. OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

- To examine the present practices of inventory management in the fast food outlets of Silchar.
- To examine the problems encountered by the vendors of the fast food outlets.

VI. HYPOTHESIS FOR THE STUDY

H₀₁: There is no significant importance of proper inventory management practices in the fast food outlets of Silchar.

H₀₂: There is no significant recognition of inventory management practices in the fast food outlets of Silchar.

H₀₃: There is no significant stock-out situation in the fast food outlets.

H₀₄: There is no significant wastage situation in the fast food outlets.

VII. SCOPE OF THE STUDY

The subject involved in this field of study is Inventory Management and in order to make the size of this research manageable, the scope of this study is limited to fast food industry only. The geographical scope of the study is the Silchar municipal area of the Barak Valley region in Assam, India.

VIII. LIMITATIONS OF THE STUDY

Due to time constraint the study was limited to the Silchar municipal area only. Respondent's time availability, casualty, disinterest towards the survey and lack of proper knowledge also remain as limitations throughout the survey as proper information could not be extracted.

IX. RESEARCH METHODOLOGY AND DATA

The present study is Exploratory in nature and a quantitative method of data collection is being used. The study analyses the responses of the vendors of the fast food outlets regarding the inventory management practices implemented by them and attempts to find out the problems arising in the process. It has been

carried out in the different fast food outlets of the Silchar municipal area. The data was collected was collected from 75 samples.

The data is primary in nature which is collected through a structured questionnaire comprising of closed-ended, multiple choice questions. For the survey purpose, stratified random sampling is being used as the sampling method and the sampling elements in the population are divided into stratas comprising of the main municipal areas of Silchar such as: Tarapur, Vivekananda Road, College Road, Ambicapatty, Hospital Road, Central Road, Shillong Patty, Rangirkhari.

For the purpose of analysis, data are tabulated in a simplified manner and calculated with the help of percentage. Conclusions are being drawn with the help of XY chart, Chi-square (χ^2) test, descriptive statistics and correlation to find out the desired result which fulfils the objectives of the study.

X. ANALYSIS AND FINDINGS

The questionnaire consists of the following questions whose analyses are being shown as follows:

1. Extent of proper inventory management practices important for the fast food business

Attributes	Frequency	Percentage
Not at all	3	4
Very little	2	2.7
Somewhat	9	12
Quite a bit	42	56
Great extent	19	25.3
Total	75	100

Source: Collected from primary data through field survey

Table-1 (a): Extent of proper inventory management practices important for the fast food business

Chi-square (χ^2) test:

The null hypothesis as H_{01} and the alternative hypothesis as H_{11} such that:

H_{01} : There is no significant importance of proper inventory management practices in the fast food outlets of Silchar.

H_{11} : There is a significant importance of proper inventory management practices in the fast food outlets of Silchar.

Attributes	O	E	O-E	(O-E) ²	(O-E) ² /E
Not at all	3	15	-12	144	9.6
Very little	2	15	-13	169	11.3
Somewhat	9	15	-6	36	2.4
Quite a bit	42	15	27	729	48.6
Great extent	19	15	4	16	1.1
Total					72.93

Table-1 (b): Calculation of Chi-square (χ^2) test

From the above table we can see that the calculated value of χ^2 is 72.93.

The Critical value of χ^2 at 4 degrees of freedom and 5% level of Significance is 9.49.

$$\text{Since, } \chi^2_{\text{cal}} > \chi^2_{\text{tab}}$$

Hence, H_{01} is rejected and H_{11} is accepted.

From table 1 (b), it can be seen that the calculated value (72.93) of χ^2 is greater than the tabulated value i.e. the critical value (9.49), thus, the null hypothesis is rejected and the alternative hypothesis is accepted i.e.

there is a significant importance of inventory management practices in the fast food outlets of Silchar according to the vendors.

Mean	3.96
Standard Error	0.106441203
Median	4
Mode	4
Standard Deviation	0.921807859
Sample Variance	0.84972973
Kurtosis	2.754072763
Skewness	-1.40824163
Range	4
Minimum	1
Maximum	5
Sum	297
Count	75
Confidence Level (95.0%)	0.212088724

Table-1 (c): Result of descriptive statistics of the extent of proper inventory management practices important for the fast food business

From table 1 (c), it can be observed that the mean is 3.96 i.e. the average response is almost equal to 'quite a bit', the median is 4, the mode is also 4 i.e. the frequency of 'quite a bit' is the maximum. The standard deviation is 0.92 and the sample variance is 0.85 which is quite low, meaning that most of the responses are close to the mean. The value of kurtosis is 2.75, which is less than 3, thus the distribution is platykurtic. The distribution is negatively skewed with a value of -1.4 since here mean (3.9) < mode (4).

2. Extent of recognition of inventory management practices in the business

Attributes	Frequency	Percentage
Not at all	7	9
Very little	13	17.3
Somewhat	24	32
Quite a bit	12	16
Great extent	19	25.3
Total	75	100

Source: Collected from primary data through field survey

Table-2 (a): Extent of recognition of inventory management practices in the business

Chi-square (χ^2) test:

The null hypothesis as H_{02} and the alternative hypothesis as H_{12} such that:

H_{02} : There is no significant recognition of inventory management practices in the fast food outlets of Silchar.

H_{12} : There is a significant recognition of inventory management practices in the fast food outlets of Silchar.

Attributes	O	E	O-E	(O-E) ²	(O-E) ² /E
Not at all	7	15	-8	64	4.266666667
Very little	13	15	-2	4	0.266666667
Somewhat	24	15	9	81	5.4
Quite a bit	12	15	-3	9	0.6
Great extent	19	15	4	16	1.066666667
Total					11.6

Table-2 (b): Calculation of Chi-square (χ^2) test

From the above table we can see that the calculated value of χ^2 is 11.6.

The Critical value of χ^2 at 4 degrees of freedom and 5% level of Significance is 9.49.

$$\text{Since, } \chi^2_{\text{cal}} > \chi^2_{\text{tab}}$$

Hence, H_{02} is rejected and H_{12} is accepted.

From table 2 (b), it can be seen that the calculated value (11.6) of χ^2 is greater than the tabulated value i.e. the critical value (9.49), thus, the null hypothesis is rejected and the alternative hypothesis is accepted i.e. there is a significant recognition of inventory management practices in the fast food outlets of Silchar.

Mean	3.306666667
Standard Error	0.148230808
Median	3
Mode	3
Standard Deviation	1.283716452
Sample Variance	1.647927928
Kurtosis	-0.99251602
Skewness	0.238889723
Range	4
Minimum	1
Maximum	5
Sum	248
Count	75
Confidence Level (95.0%)	0.295356327

Table-2 (c): Result of descriptive statistics of the extent of recognition of inventory management practices in the business

From table 2 (c), it can be observed that the mean is 3.3 i.e. the average response is a little greater than 'somewhat', the median is 3, the mode is also 3 i.e. the frequency of 'somewhat' is the maximum. The standard deviation is 1.28 and the sample variance is 1.64 which is quite low, meaning that most of the responses are close to the mean. The value of kurtosis is -.99, which is less than 3, thus the distribution is platykurtic. The distribution is positively skewed with a value of 0.238 since here mean (3.3) > mode (3).

3. Presence of inventory management system in the fast food outlets

Attributes	Frequency	Percentage
Yes	9	12
No	66	88
Total	75	100

Source: Collected from primary data through field survey

Table-3: Presence of inventory management system in the fast food outlets

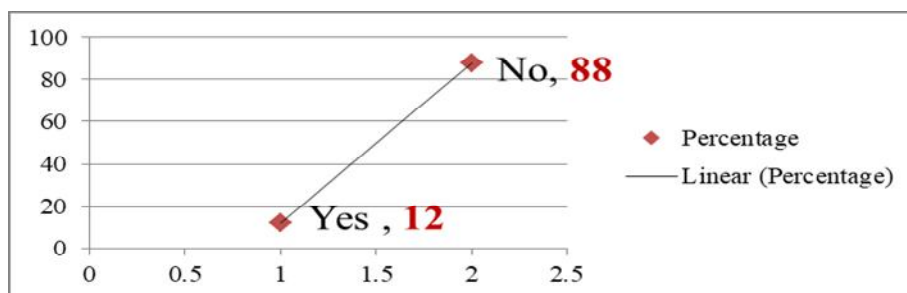


Figure-3: An X Y Chart showing percentage of presence of inventory management system in the fast food outlets

The above data indicates that out of 75 respondents, only 12% use any inventory management system in their outlets whereas most of them i.e. 88% do not use any inventory management system in their outlets.

4. Frequency of stock-outs that the vendors have on a day-to-day basis

Attributes	Frequency	Percentage
Most of the time	6	8
Often	7	9.3
Sometimes	18	24
Seldom	42	56
Never	2	2.7
Total	75	100

Source: Collected from primary data through field survey

Table-4 (a): Frequency of stock-outs that the vendors have on a day-to-day basis

Chi-square (χ^2) test:

The null hypothesis as H_{03} and the alternative hypothesis as H_{13} such that:

H_{03} : There is no significant stock-out situation in the fast food outlets of Silchar.

H_{13} : There is a significant stock-out situation in the fast food outlets of Silchar.

Attributes	O	E	O-E	(O-E) ²	(O-E) ² /E
Most of the time	6	15	-9	81	5.4
Often	7	15	-8	64	4.266666667
Sometimes	18	15	3	9	0.6
Seldom	42	15	27	729	48.6
Never	2	15	-13	169	11.26666667
Total					70.13333333

Table-4 (b): Calculation of Chi-square (χ^2) test

From the above table we can see that the calculated value of χ^2 is 70.13.

The Critical value of χ^2 at 4 degrees of freedom and 5% level of Significance is 9.49.

$$\text{Since, } \chi^2_{\text{cal}} > \chi^2_{\text{tab}}$$

Hence, H_{03} is rejected and H_{13} is accepted.

From table 4 (b), it can be seen that the calculated value (70.13) of χ^2 is greater than the tabulated value i.e. the critical value (9.49), thus, the null hypothesis is rejected and the alternative hypothesis is accepted i.e. there is a significant stock-out situation in the fast food outlets of Silchar.

Mean	3.36
Standard Error	0.113328034
Median	4
Mode	4
Standard Deviation	0.981449562
Sample Variance	0.963243243
Kurtosis	0.537043931
Skewness	-1.137892689
Range	4
Minimum	1
Maximum	5
Sum	252
Count	75
Confidence Level (95.0%)	0.225811033

Table-4 (c): Result of descriptive statistics of the frequency of stock-outs that the vendors have on a day-to-day basis

From table 4 (c), it can be observed that the mean is 3.3 i.e. the average response is a little greater than 'somewhat', the median is 4, the mode is also 4 i.e. the frequency of 'seldom' is the maximum. The standard deviation is 0.98 and the sample variance is 0.96 which is quite low, meaning that most of the responses are close to the mean. The value of kurtosis is 0.53, which is less than 3, thus the distribution is platykurtic. The distribution is negatively skewed with a value of -1.14 since here mean (3.3) < mode (4).

5. Frequency of wastages that the vendors have on a day-to-day basis

Attributes	Frequency	Percentage
Most of the time	2	2.7
Often	46	61.3
Sometimes	17	22.7
Seldom	9	12
Never	1	1.3
Total	75	100

Source: Collected from primary data through field survey

Table-5 (a): Frequency of wastages that the vendors have on a day-to-day basis

Chi-square (χ^2) test:

The null hypothesis as H_{04} and the alternative hypothesis as H_{14} such that:

H_{04} : There is no significant wastage situation in the fast food outlets of Silchar.

H_{14} : There is a significant wastage situation in the fast food outlets of Silchar.

Attributes	O	E	O-E	(O-E) ²	(O-E) ² /E
Most of the time	9	15	-6	36	2.4
Often	46	15	31	961	64.06666667
Sometimes	17	15	2	4	0.266666667
Seldom	2	15	-13	169	11.26666667
Never	1	15	-14	196	13.06666667
Total					91.06666667

Table-5 (b): Calculation of Chi-square (χ^2) test

From the above table we can see that the calculated value of χ^2 is 91.06.

The Critical value of χ^2 at 4 degrees of freedom and 5% level of Significance is 9.49.

$$\text{Since, } \chi^2_{\text{cal}} > \chi^2_{\text{tab}}$$

Hence, H_{04} is rejected and H_{14} is accepted.

From table 5 (b), it can be seen that the calculated value (91.06) of χ^2 is greater than the tabulated value i.e. the critical value (9.49), thus, the null hypothesis is rejected and the alternative hypothesis is accepted i.e. there is a significant wastage situation in the fast food outlets of Silchar.

Mean	2.466666667
Standard Error	0.089710914
Median	2
Mode	2
Standard Deviation	0.776919303
Sample Variance	0.603603604
Kurtosis	0.828527573
Skewness	1.090814645
Range	4
Minimum	1
Maximum	5
Sum	185
Count	75
Confidence Level (95.0%)	0.178752895

Table-5 (c): Result of descriptive statistics of the frequency of wastages that the vendors have on a day-to-day basis

From table 5 (c), it can be observed that the mean is 2.47 i.e. the average response is in between ‘often’ and ‘sometimes’, the median is 2, the mode is also 2 i.e. the frequency of ‘often’ is the maximum. The standard deviation is 0.78 and the sample variance is 0.60 which is quite low, meaning that most of the responses are close to the mean. The value of kurtosis is 0.83, which is less than 3, thus the distribution is platykurtic. It does not signify that the distribution is “flat-topped”, rather, it means the distribution produces fewer and less extreme deviations than the normal distribution. The distribution is positively skewed with a value of 1.09 since here mean (2.47) > mode (2).

Correlation Analysis:

Pearson’s correlation coefficient is carried out between the data of stock-outs and wastages to examine if the two factors are correlated to one another and if correlated, to what degree their association is. Stock-outs are taken along the X-axis and wastages along the Y-axis.

	Stock-outs	Wastages
Stock-outs	1	
Wastages	-0.101129979	1

Table-5 (d): Correlation between stock-out and wastages

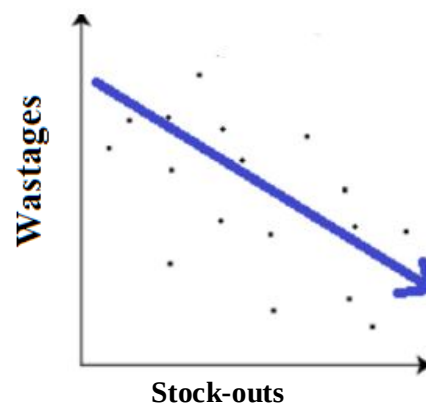


Figure-5 (d): Negative correlation strength

The above data indicates that the value of the correlation coefficient, r is -0.10. So, by analyzing the data it can be interpreted that stock-outs and wastages are negatively correlated and are inversely proportional but

have a very weak strength of only 10%. Thus, increase in stock-outs may reduce wastages and vice versa but is not certain and results very rarely.

XI. CONCLUSION

The study used primary data to analyze the inventory management practices in the fast food outlets in Silchar municipal area. It also analyzes the problems encountered by the vendors with respect to inventory management on a day-to-day-basis. The study highlighted that the fast food outlets in Silchar do not have any inventory management system and also do not recognize proper inventory management practices to a full extent yet, which is the need of the hour with the ever increasing customer demands. It can be concluded that in order to understand what features of inventory management needs to be changed to meet customer's likings, it is necessary to restructure the traditional way of management of inventory and use agile and adaptive inventory management system to automate the processes which will avoid stock-outs and wastages. Thus the inventory management system can become efficient.

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